HOUSING *of* MINERS

Industrial Hygiene

DR. JOHN C. M'VAIL

HOUSING OF SCOTTISH MINERS

REPORT

ON THE

HOUSING OF MINERS

IN

STIRLINGSHIRE AND DUNBARTONSHIRE

BY

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NOTE.

This Report is one of several which have been asked for by the Local Government Board from the Medical Officers of Mining Counties in Scotland. It is now published by the County Councils in compliance with a request by the Board.

County Health Offices,
24 George Square,
Glasgow, July, 1911.

CONTENTS.

PART I.

INTRODUCTORY.

	PAGES
Number of Coal Miners in the two Counties—Distribution of Coal-mining. Growth of industry since 1861. Statistics of Employees, above and below ground, various ages, both sexes	1-11
Scope of Report	12-14
A Typical Colliery Village	14-16
Classification of Villages	16

PART II.

HOUSES ERECTED UNDER BUILDING BYE-LAWS (SINCE 1899).

Scope and limitations of Bye-laws. Site and surroundings. Ground Level. Structure. Statistics of Dimensions—number and size of apartments. Bedplaces. Sculleries. Light and Ventilation. Back Doors. Inside Water Supply. Baths. Washing Houses. Coal Cellars. Sanitary conveniences. Drainage. Roadways and Footpaths	17-32

PART III.

HOUSES BUILT BEFORE 1899.

Numbers. Dates of erection in various districts. Structure. Dimensions—number of apartments and cubic capacity. Bedplaces. Sculleries. Light and Ventilation. Inside Water Supply. Baths. Washing Houses. Coal Storage. Sanitary conveniences. Drainage. Roadways and Footpaths	33-36

PART IV.

ADMINISTRATION.

PAGES

(1) Refuse Removal. Daily removal. Privy Middens and spread of Disease. Special Scavenging Districts. Allocation of Cost. In dying Collieries. In old Rows. A Vicious Circle, how broken. General Scavenging. Water Closets. Dry Closets. Privacy and responsibility. The Block System of Outhouses. Back Doors - - - - - - - - - - - - 37-44

(2) Coal Storage. Under Kitchen Beds. In Coal Cellars. Supplies from Pithead - - - - - - - - - - - 44

(3) Water Supply.

(*a*) Sources. Upland Surface Water—East Stirlingshire. Mine Water—Its risks and their prevention. Storage of Mine Water. Hardness and its removal. Quantity. Mine Water Supply during Strikes and Locks-out. Other Sources. Cumbernauld parish. Water Supply to Mine Workings - - - - - - - - - - 44-49

(*b*) Distribution. Outdoor, pillar wells or stand pipes. Indoor, in window places or sculleries - - - - - - - - 49

(4) Baths. How far used - - - - - - - - - - 49

(5) Washing Houses. Absence of Washing Houses, a nuisance under Public Health Act. Water Supply to Washing Houses. Proximity to Ashpit. Collection of Roof Water for washing purposes - - - - - - - - - - - - - 50-52

(6) Hot-Water Supply. Utilisation of Waste Steam from Colliery Workings - - - - - - - - - - - - - 52

(7) Clothes Drying and Bleaching. Facilities for - - - - 52

(8) Drainage. Open Channels. Automatic Flushing Tanks. Defective Gutters. Denholm's Sinks. Risks of Open Channels, example of. Covered Drains. Drainage Outfalls - - - - 53-55

(9) Gardens. Fencing. Advantages of Gardens - - - - - 55

(10) Roadways and Footpaths.

(*a*) Roadways. Condition of Roads of access to Mining Villages. Powers of District Committees in Special Scavenging Districts. Question of Nuisance under Public Health Act - - - - - - - - - - - 55

(*b*) Footpaths. In relation to indoor cleanliness - - - 56

(*c*) Doorsteps - - - - - - - - - - - - - 56

(11) Lighting. Oil. Coal Gas. Electric Lighting - - - - 57

PAGES

(12) RENTS.

(a) Average Rents of houses of one, two, three, and four apartments in East Stirlingshire, East Dunbartonshire, and Central Stirlingshire - - - - - - - - 57

(b) Deduction of Rents and Rates from Wages - - - 58

(c) Proportion of income devoted to house accommodation - 58

(d) Mine Owners' control over standard of housing. English cottage style - - - - - - - - - - - 59

(e) Cost of Miners' Houses, with drainage, roadways, etc. - 60

(13) BUILDING LEASES AND FEUS. Influence of County Council requirements. Change of practice. Conditions affecting quality of housing provided - - - - - - - - 62

(14) PROCEEDINGS OF SANITARY AUTHORITIES.

(a) Administration of Public Health Acts. Building Bye-laws. Effects of local habit and tradition - - - - - 62

(b) Overcrowding - - - - - - - - - - - 62

(c) Housing of the Working Classes Act. Closure of Insanitary Houses. Effect of exhaustion of collieries - - - 65

(d) Renovation. Conditions influencing degree of renovation. Character of alterations. Imperfect remedy of damp. Limitations of renovation - - - - - - - - 66

SUMMARY of requirements, administrative and structural. Matters for which further powers are needed - - - - - - 67

THE COAL MINES BILL, 1911: Provision of Baths at Mines - - 69

HEALTH DEPARTMENT
24 GEORGE SQUARE,
GLASGOW, 18*th October*, 1909.

The SECRETARY,
Local Government Board,
Edinburgh.

SIR,

HOUSING OF SCOTTISH MINERS.

As requested in the Board's Letter of 13th April last, I now have the honour to submit a report on the Housing of Miners in the Counties of Stirling and Dunbarton.

PART I.—INTRODUCTORY.

The number of persons employed in the two counties under the Coal Mines Regulations Act was 11,850 in 1907, and 12,276 in 1908.[1] Including miners' families I calculate that the population depending on the industry is just under 42,000. This estimate is made up as follows. The Chief Constables of the two counties were kind enough to make for me a census of the mining population occupying houses belonging to the mine owners in the landward or non-burghal areas. This census, as noted at p. 14, shows that the number of miners per house in 1908 was 1·65. For 12,323 employees there would therefore be 7,468 houses. Five persons per house is an ordinary calculation, but another census taken for the purpose in a number of typical colliery villages has brought out the fact that in 2,266 miners' houses there were 12,670 inmates, so that the average number of persons per house was 5·590. Assuming a similar rate for the 7,468 houses, their total population would be 41,756.

The County of Stirling is for purposes of public health administration divided into three districts—Central, Eastern, and

[1] Under the Metalliferous Mines Acts 35 persons were employed in 1908.

Persons Employed in 1908.

County.	No. of Mines at Work	Below Ground.				Above Ground.								Total Number Employed below and above ground.
		Males.				Males.				Females.				Total above ground.
		Ages 13, 14.	Ages 14-16.	Ages above 16.	Total below ground.	Ages 12-14.	Ages 14-16.	Ages above 16.	Total Males.	Ages 12-14.	Ages 14-16.	Ages above 16.	Total Females.	
Stirling (East),	24	7	262	2,893	3,162	5	45	570	620	—	24	91	115	735	3,897
Stirling (Rest of),	17	—	224	4,792	5,016	—	135	1,214	1,349	—	14	74	88	1,437	6,453
Dunbarton,	10	—	46	1,478	1,524	—	30	387	417	—	—	32	32	449	1,973
Totals,	51	7	532	9,163	9,702	5	210	2,171	2,386	—	38	197	235	2,621	12,323

Western. In the Western District there is hardly any mining, only one colliery (a new one) being situated at its south-eastern end. In the Central District coal has long been worked along its southern border in the parishes of Kilsyth and Denny, and during the last few years mining has developed largely in the eastern part of the parish of St. Ninians—the Carse of Stirling, south of the river Forth and south-east of the county town. In the Eastern District the upper seams have been nearly exhausted in the important coal-field of Slamannan in the extreme south, and the mining population is rapidly diminishing there; but further north, in Falkirk and Grangemouth parishes, coal winning is an important industry, and one or two large new mines have lately been opened.

In Dunbartonshire the industry is almost entirely confined to the detached part of the county, consisting of the parishes of Kirkintilloch and Cumbernauld.

The following table shows the growth of coal mining since 1861:

Persons Employed.

County.	1861.	1871.	1881.	1891.	1901.	1907.	1908.
Stirling,	2,737	3,821	3,492	5,317	7,814	9,933	10,350
Dunbarton,	504	675	627	1,320	1,760	1,917	1,973
Total,	3,241	4,496	4,119	6,637	9,574	11,850	12,323

The figures for 1907 and 1908 are taken from the Reports of H.M. Inspectors of Mines, and the rest from the Decennial Census Reports. The former reports include the particulars for 1908, as shown on page 8. [For 1910 the figures are: Stirlingshire 10,600, Dunbartonshire 2,236—total, 12,836.]

The number of male employees over 16 years of age was, in 1908, below ground 9,163, and above ground 2,171, or a total of 11,334.

Though the following tables have no special relation to housing I insert them as possibly of interest with regard to age and sex. They also show the diminution which has taken place in the number of persons engaged in other kinds of mining in the two counties.

COUNTY OF STIRLING.

Year.	MALES. Under 15 Years.	15 to 20 Years.	Above 20 Years.	Total at all ages.		FEMALES. Under 15 Years.	15 to 20 Years.	Above 20 Years.	Total at all ages.
1861	351	994	1,392	2,737	1. Coal and Shale Miners.	—	—	—	—
	60	252	473	785	2. Other Miners.	1	—	—	1
1871	511	1,295	1,977	3,783	1. Coal and Shale Miners.	38	—	30	68
	82	271	473	826	2. Other Miners.	3	—	2	5
1881	311	1,247	1,872	3,430	1. Coal and Shale Miners.	62	1	22	85
	33	284	536	853	2. Other Miners.	8	—	7	15
1891	349	2,932	1,950	5,231	1. Coal and Shale Miners.	86	2	34	172
	14	111	365	490	2. Other Miners.	—	—	—	—
1901	343	2,783	4,558	7,684	1. Coal and Shale Miners.	130	15	89	234
	3	32	165	200	2. Other Miners.	—	—	—	—

	Under 16 Years.	Over 16 Years.	Total at all ages.		Under 16 Years.	15 to 20 Years.	Total at all ages.
1907[1]	661	9,068	9,729	1. Coal Miners, - - -	41	163	204
	1	31	32	2. Other Miners, - -	—	—	—
1908[1]	678	9,469	10,147	1. Coal and Shale Miners, -	38	165	203
	2	33	35	2. Other Miners, - -	—	—	—

[1] Statistics for 1907 and 1908 taken from Reports of H.M. Inspectors of Mines; those for 1861-1901 taken from the Decennial Census Reports.

COUNTY OF DUNBARTON.

Year.	MALES. Under 15 Years.	15 to 20 Years.	Above 20 Years.	Total at all ages.		FEMALES. Under 15 Years.	15 to 20 Years.	Above 20 Years.	Total at all ages.
1861	48	188	268	504	1. Coal and Shale Miners.	—	—	—	—
	6	42	49	97	2. Other Miners.	—	—	—	—
1871	91	225	359	675	1. Coal and Shale Miners.	—	—	—	—
	100	228	411	739	2. Other Miners.	—	—	—	—
1881	34	239	329	602	1. Coal and Shale Miners.	3	21	1	25
	56	352	545	953	2. Other Miners.	—	—	—	—
1891	62	507	742	1,311	1. Coal and Shale Miners.	—	7	2	9
	4	115	191	310	2. Other Miners.	—	—	—	—
1901	50	592	1,105	1,747	1. Coal and Shale Miners.	—	11	2	13
	—	12	57	69	2. Other Miners.	—	—	—	—

	16 Years and under.	Over 16 Years.	Total at all ages.		16 Years and under.	Over 16 Years.	Total at all ages.
1907[1]	84	1,797	1,881	1. Coal and Shale Miners, -	1	35	36
	—	—	—	2. Other Miners, - -	—	—	—
1908[1]	76	1,865	1,941	1. Coal and Shale Miners, -	—	32	32
	—	—	—	2. Other Miners, - -	—	—	—

[1] Statistics for 1907 and 1908 taken from Reports of H.M. Inspectors of Mines; those for 1861-1901 taken from the Decennial Census Reports.

Scope of Report.—A stranger to the subject might ask why the housing of miners should be specially investigated, rather than that of shipbuilders, engineers, textile factory employees, or persons belonging to any other occupation. The answer is to be found in the conditions of the industry. Other workers, excepting those engaged on the land, are usually employed in or close to towns or cities where house accommodation is obtained in the ordinary way from owners or their factors, the nature and cost of the accommodation being governed by the law of supply and demand. But coal mines may be sunk far from any centres of population, and houses have then to be provided within a convenient distance of the shafts. This is seldom or never done by private enterprise, and a mining firm, when opening a new colliery not near a town, have usually to build a village for their employees.

I assume that my report is to be confined to the housing accommodation thus provided, and need not extend to the character of the dwellings rented by mine workers who live in towns, or in villages or hamlets not belonging to mining firms. At the same time I take it that mere housing is not the whole question, and that water supply, drainage, and sanitary conditions generally are to be reported on where the houses are provided by the mine owners.

In the Counties of Stirling and Dunbarton, which are somewhat thickly populated, a very considerable majority of the miners obtain houses quite independently of their employers. Many live in the towns of Stirling, Bannockburn, Falkirk, Larbert, Slamannan, Denny, Kilsyth, Kirkintilloch, and other populous places. For example, in Kilsyth, as ascertained for me by the sanitary inspector there, no less than 1,635 miners dwell in the burgh, though only 322 are employed within it; and at Denny practically the whole of 373 employees at Herbertshire Colliery reside within the burgh, though the mine shaft is outside its boundaries. Also, some miners fond of rural life rent houses which may have been built for agricultural labourers, whilst others in course of years come to build cottages of their own in districts where they regard themselves as permanently employed, or where they propose to live on their savings after their working time has passed.

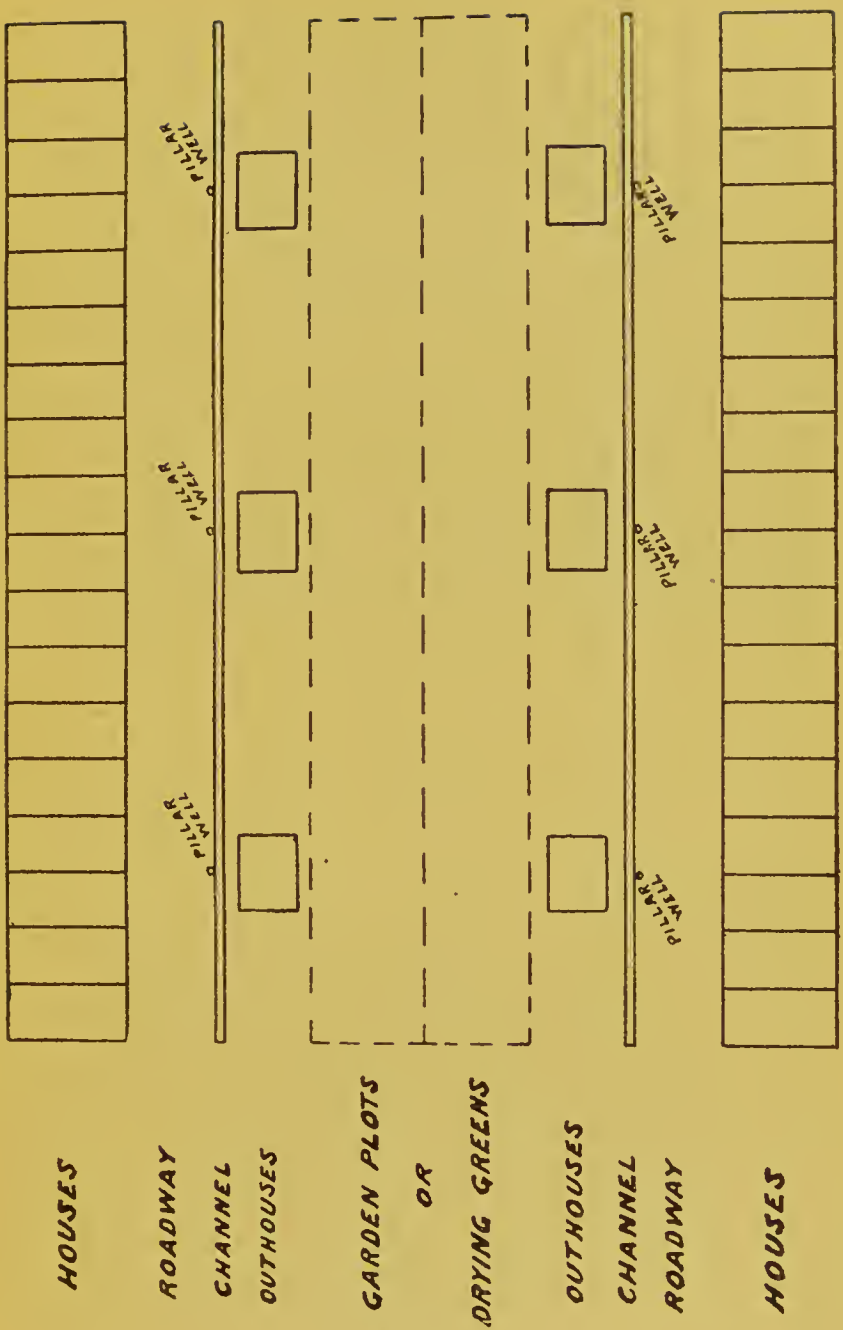

HOUSES
ROADWAY
CHANNEL
OUTHOUSES
GARDEN PLOTS
OR
DRYING GREENS
OUTHOUSES
CHANNEL
ROADWAY
HOUSES
PILLAR
WELL

FIG. 1.

The total numbers provided for in these ways are such that of the 12,276 miners in 1908, only 4,555,[1] representing a population of about 15,500, live in houses belonging to mining firms in the landward or non-burghal areas.

In the landward parts of Stirlingshire 3,747 miners occupy 2,259 houses belonging to mine owners, and in Dunbartonshire the corresponding figures are 838 miners in 495 houses. There are therefore 4,555 miners in 2,754 houses, so that the average number of miners per house is 1·65. This excess is due partly to members of the same family, say a father and one or two sons living in the same house, and partly to the occasional keeping of a lodger employed in the same mine.

A TYPICAL COLLIERY VILLAGE.

As a preliminary to more detailed report, it may be convenient to describe very briefly a standard or average mining village and miner's house, as existing in these counties.

The village consists of one or more rows of one storey brick or stone and slated houses opening on a private roadway for cart traffic, with a surface channel for drainage beyond the roadway, pillar wells at intervals beside the channel, a series of blocks of outhouses beyond it, and small gardens or clothes drying greens on the further side of the outhouses. The elements may be indicated diagrammatically, as on p. 13.

The same points are well shown in the post-card view of Barrhill Rows, at Twechar, in East Dunbartonshire.[2] A village street in central Stirlingshire is also shown (Illustration No. 3). Such is the type, but the details vary greatly. The houses may be of two storeys (as in Illustration No. 21, p. 60), and may be built in squares, or along the side of a highway, or isolated in small groups on a moorland. The surface channels may be only a few feet from the front doors of the dwellings or may be at the farther

[1] The number indeed is slightly less, for 139 of the 4,555 are in houses at North Blackbraes and South Blackbraes in Stirlingshire, built by mine owners for their workers, but now occupied by men employed in other mines in the neighbourhood.

[2] I am indebted to Mr. Alex. Rankin, Stationer, Kilsyth, and Messrs. Bennett & Sons, Photographers, St. Ninians, Stirling, for permission to reproduce photo. post cards published by them.

FIG. 2.

FIG. 3.

To face p. 14.

side of the outhouses, or there may be no such channels, their places being taken by underground drains. The water supply may be inside the houses, and the outbuildings may be differently situated or may be almost entirely absent. The gardens may be at the back or at one end of the rows, or there may be no gardens.

A collier's house consists typically of two apartments, a "room and kitchen," with a connecting door between. The entrance from the roadway is not usually quite direct, but by a small square lobby not much more than enough to allow the door to open. The wall facing the open door is the gable end of a set-in bedplace. There are two such bedplaces in the kitchen, along one wall, and on the opposite side is the fireplace, perhaps with a good, though small, cooking range. The kitchen has a window looking to the front, and the room another looking to the back, the open door between the apartments permitting some degree of through ventilation. The windows have an upper and a lower sash, which may or may not be hung on cords with pulleys. The lower sash opens upwards; the upper sash may or may not open downwards. In addition to the two apartments, there may be a small porch built out in front of the kitchen, and used as a store or a scullery, with, or more commonly without, an indoor water supply. Sometimes there are a water tap and sink in the kitchen window place. The press or storage accommodation is limited, but is supplemented by utilizing the space under the beds. In older rows this space may be the only coal store. The bedplaces are separated by a brick partition reaching to the ceiling and are structurally open from floor to ceiling and from side to side, but are partially closed in by curtains. The "room" has a fireplace on one side and a single bedplace on the other, so that in the two apartments there are usually three beds. The walls are plastered on the solid brick or stone, or (in a minority) the outer walls are lathed and strapped; in an increasing number they are hollow, with a space of three inches between the inner and outer brickwork. The floors are of wood; or the kitchen floor is of pavement brick or cement concrete, and the room floor of wood. The wooden floors are usually ventilated underneath, but not always in the older houses. The ceiling is plastered, or occasionally wood-lined, and the roof is of slate, less frequently of red tiles. The kitchen,

excluding the bedplaces, is about 15 feet long by 10 or 11 feet broad and 9 feet high, so that its capacity is about 1,400 cubic feet, or with the bedplaces about 2,000 cubic feet. The room is of the same width and height, but is probably somewhat shorter from front to back. The roof water may be carried by an eaves gutter and down pipe into a large barrel, for use in clothes washing, but the barrel may be wanting or the eaves gutters broken, and the water may discharge on the ground at the base of the wall.

As in the case of the village, the details of the house may vary greatly. It may have only one apartment, occasionally three, but very seldom four, the third or fourth being perhaps an attic. The building may be only one room wide from front to back. The windows may be large, reaching nearly to the ceiling, or may not come within two feet of it, and there may be a foot or two of 'camceiling' (in England, splay roofing), leaving an unventilated space above the window tops. In a few old houses the window may have only a single hinged pane for ventilation. If the house is only one room wide there is often a back window, probably a single large hinged pane, a little more than halfway up the wall. There may be an open iron bedstead instead of a set-in bedplace in the room,—sometimes in both apartments in the newer rows. In the newer houses there may be a good scullery with water supply, clothes boiler, and, in a few three-roomed houses, a plunge bath. There may also be a water-closet opening off the scullery.

As in the case of other working-class dwellings in the country, the principal defects to be looked for within the older houses are insufficient air space and ventilation, damp walls and irregular floors harbouring dirt.

Classification.—The above are the types. In entering on details, classification is necessary, and the main basis must be the age of the houses. The simplest grouping will be into (1) Houses erected under Building Bye-laws framed in accordance with the Public Health (Scotland) Act, 1897, and (2) Houses erected previously. This latter group could itself bear much subdivision, but the former will engage attention first.

PART II.

HOUSES ERECTED UNDER BUILDING BYE-LAWS.

In accordance with bye-laws framed under section 181 of the Public Health (Scotland) Act, 1897, the plans of all new buildings have to be submitted to the District Committees of the County Councils. The bye-laws relate to soil drainage; structure of walls, foundations, roofs, and chimneys in so far as likely to affect human health; ventilation; sufficiency of space about buildings; construction and arrangement of drainage, soil pipes, waste pipes, water-closets, earth-closets, privies, ashpits, cesspools, dungsteads, slop-sinks, and rain-water pipes and rhones; and the production of plans and inspection of houses in course of erection. It is a feature of County government in Scotland that all building plans are inspected by the Health Department.

The bye-laws are invaluable, but their scope is limited. They cannot compel the erection of coal-houses or wash-houses or sculleries, nor the supply of water within houses, nor can they regulate the dimensions of living rooms and sleeping rooms, nor prevent the erection of dwellings of one apartment. Usually, however, plans submitted include a good deal more than the bye-laws demand, and they bring the owners into communication with the Local Authority, whose advice may be accepted where compulsion is impossible. The making of bye-laws is not obligatory, but they have been in force in these counties since early in 1899.

In the landward part of the two counties the total number of dwellings built under the bye-laws by mine owners for miners has been 873.[1]

[1] This number includes a very few houses leased to mining firms after having been erected privately.

Site and Surroundings.—A block plan is required showing the site and surroundings. The following bye-laws regulate the extent of open space in front of and behind houses :

13. Every house or building shall be provided with an open space in front, free from any erection thereon, except portico, porch, step, or other like projection, or gate, fence, or wall, not exceeding seven feet in height. Such open space shall extend forwards throughout the whole line of frontage of such house or building. Where such open space belongs exclusively to the house or building, it shall extend from the face of the front wall to a distance not less than two-thirds the height of the house or building. Where such open space is formed wholly or in part by a street, road, or public place, it shall extend to a distance not less than twenty-five feet, measured from the centre of the street or road to the front wall of the house or building, or to such a distance as may be sanctioned by the Local Authority.

14. Every house or building shall be provided with an open space in the rear, free from any erection thereon, except closet, privy, ashpit, wash-house, or other convenience approved of by the Local Authority. Such open space shall extend backwards throughout the whole line of the back wall of the house or building. Where such open space belongs exclusively to the house or building, it shall extend from the face of the back wall thereof to a distance not less than two-thirds the height of the house or building. Where such open space is formed wholly or in part by a street, road, or public place, it shall extend to a distance not less than twenty-five feet, measured from the centre of the street to the back wall of the house or building, or to such a distance as may be sanctioned by the Local Authority.

For the purpose of this and the immediately preceding bye-law the height of such house or building shall be measured upwards from the level of the ground over which such open space shall extend to the level of half the vertical height of the roof.

Ground Level.—The floor level of the ground flat is above the ground level in all the 873 houses.

Structure.—The walls of buildings for which plans are submitted are invariably of stone or brick. Wood as the material for walls is never used, excepting in the case of navvies' huts.

The outer walls, if of stone, are strapped and lathed, and plastered on the inner surface. If of brick they are often built hollow to save strapping and lathing, the plastering being directly on the brick. Of the 873 houses built under the bye-laws, 466 have the walls lathed and strapped, whilst 407 are built hollow. I decidedly prefer the former, as the wall is warmer, and moisture is less apt to deposit on it in damp or cold weather. Against strapping and lathing it is sometimes urged that bad tenants will by rough usage break the lath and plaster. It cannot be denied that this sometimes occurs, but, as urged later on, it should be the aim of colliery firms to build good houses and secure good tenants, rather than make provision against bad ones. Where the walls are hollow they are bound together by twisted iron ties. It is always necessary to see that if there is a press in the depth of a wall, whether hollow or solid, the thin part of the wall at the back of the press be strapped and lathed as well as plastered, to prevent damp. At the sides of doors and windows, if the outer and inner divisions of a hollow wall are connected by brick-work, damp is apt to be admitted from rain beating on the wall. It is, therefore, a requirement either that bricks used in these positions shall have been dipped in tar to prevent conveyance of damp, or that the walls shall be continued hollow right up to the wooden framework of the door or window places.

A damp-proof course is always required, and the material and thickness have to be specified. Caithness pavement is the best, but other materials are accepted if thought sufficient. It would be useful if resort to the best material could be enforced.

The floors are practically always of wood, excepting in sculleries, where cement concrete is often used. Wood floors are ventilated underneath.

The roofs of new houses are always slated. The picturesque red-tiled roofs are of older date. Eaves-gutters and rain pipes discharge either into open inverts or covered drains, or into water barrels where roof water is used for washing, owing to other available water being too hard.

Dimensions. Number of Apartments.—Of the 873 houses, 22, or 2·5 per cent., are houses of one apartment; 735, or 84·2 per per cent., have two apartments; 100, or 11·5 per cent., have three

apartments; and 16, or 1·8 per cent., have four apartments. The four-roomed houses are all in one group, and were not built exclusively for miners, but may be occupied by other employees —foundry workers—of the same Company. No plans have been submitted for miners' houses of more than four apartments. No one-roomed houses have been built since 1904, and 16 of the total 22 belong to the year 1899.

Size of Apartments.—The cubic capacity of the 22 one-roomed

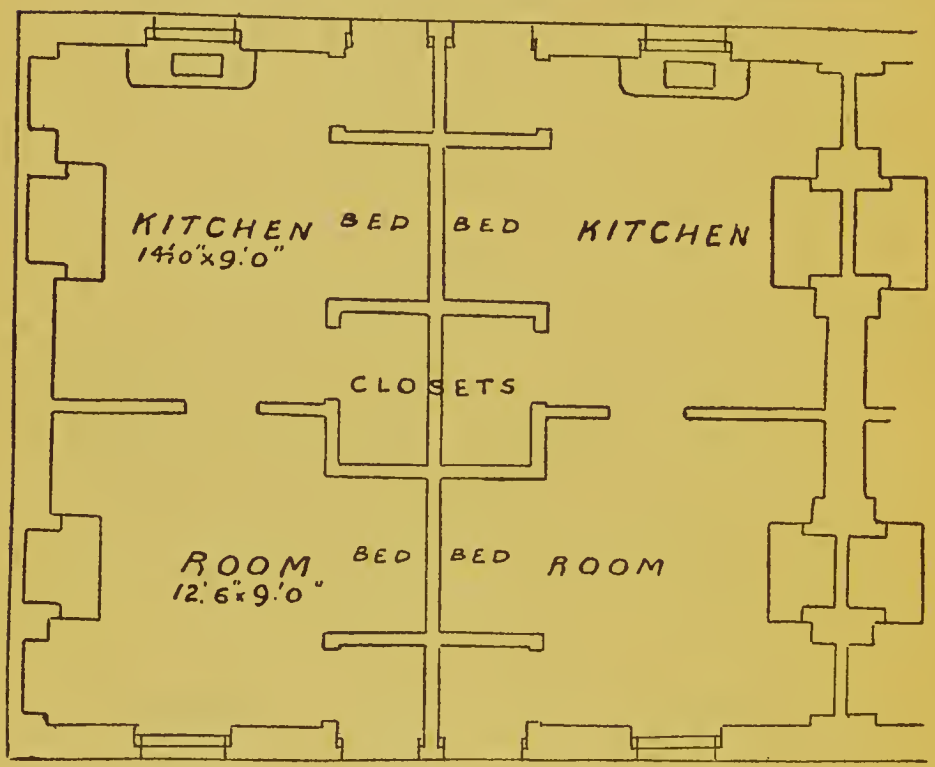


FIG. 4.

houses ranges from 2,280 to 2,424 cubic feet, the average being 2,300.

The 735 two-roomed houses range in size from 2,963 to 4,440 cubic feet.

Here is a plan of some rather small two-roomed houses. If the spaces described as closets had been open from end to end they would have been indicated as for set-in beds, but the length of the kitchen is insufficient to permit this. Naturally the restriction of the sleeping accommodation restricts also the number of occupiers, but in fact such a closet occasionally is used for a bed. This plan may be contrasted with those on pp. 25 and 31, where the kitchen is large enough to allow two bedplaces open from end to end.

In the 100 three-roomed houses the capacity ranges from 4,247 to 7,690 cubic feet, the mean of the 100 being 5,448 feet.

The 16 four-roomed houses have a cubic capacity of 5,200 feet, or less than that of the three-roomed houses. This is partly due to two of the apartments being small attics, and to space occupied in stairways and scullery. The following table summarises these facts:

Number of Apartments.	Number of Houses.	Total Space in cubic feet.	Average Space in cubic feet.
One, - - -	22	50,512	2,296
Two, - - -	735	2,719,889	3,700
Three,- - -	100	544,777	5,448
Four, - - -	16	83,200	5,200
Total, - -	873	3,398,378	3,892

Bedplaces.—The Building Bye-law with regard to bedplaces is as follows:—Every recess constructed or adapted for a bed shall be open in front for, at least, three-fourths of its length and from floor to ceiling or to within one foot of the ceiling where a beam occurs, and no doors shall be allowed for any such recess.

The bye-law is strictly enforced and in not very many cases is the provision taken advantage of which allows the bedplace to be closed in for one-fourth its length.

The set-in bed has from time out of mind been a feature of working-class dwellings in Scotland. Most of these houses have only two apartments, both of which have commonly to be used as sleeping rooms, and the bed recesses give a certain amount of separation or privacy. Box beds entirely closed in by a door are

still seen occasionally in the kitchen of an old farmhouse. Where such a closet as is shown at p. 20 is used for a bed, the conditions are little better than those of a box bed. Even the most open of set-in bedplaces are nearly always adorned with curtains, which hinder access of air. To check this fault, the wooden 'brow band' at the ceiling is now forbidden in new buildings, but if the facing of the brick partition between the two kitchen bedplaces is, with the same object, left plastered instead of being wood-lined, the plaster is often broken by the driving in of nails to hold the curtains. Wooden bed-boards and 'stocks' were as

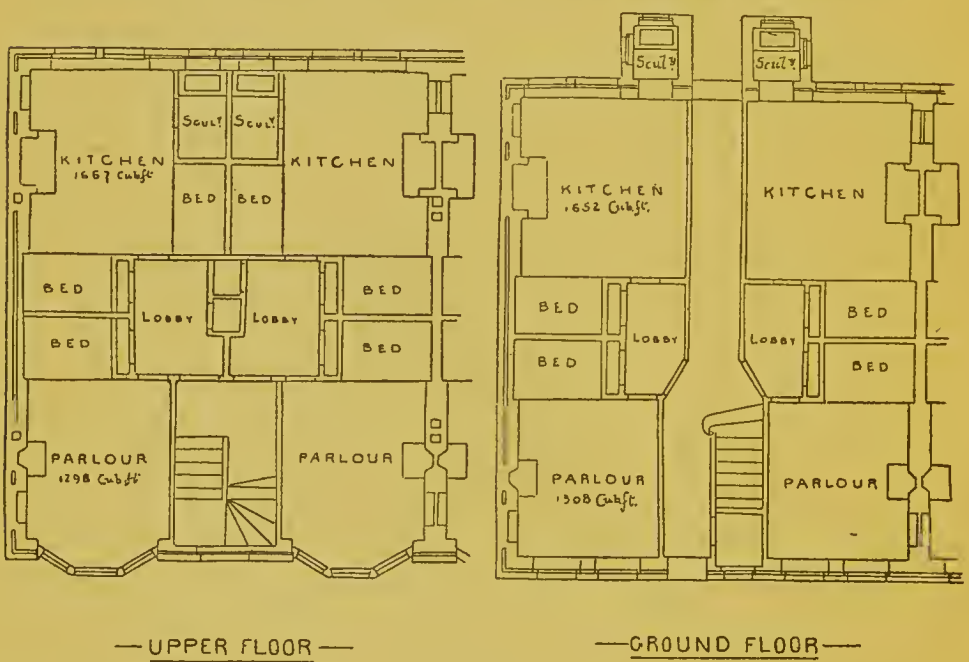


Fig. 5.

universal as bedplaces, and did not make for cleanliness, but were apt to harbour vermin if the house were kept dirty. Occasionally a defaulting tenant about to evacuate a house, would combine economy with sanitary reform by using the bed-boards for firewood. In connection with the plans of some of the newer villages, the owners have acceded to the request to provide iron bedsteads for the bedplaces. Also, in the 'room' there is often now no set-in bedplace, but only an iron bedstead in a corner, as in bedrooms of better-class dwellings.

Sculleries.—As has been seen, a house of two apartments is the standard accommodation for a miner and his family. This is quite a usual size of house for the working classes in general throughout Scotland, but in many modern two-roomed houses a good scullery is provided, which is an important addition to the amenity of the dwelling. Of the 873 houses for which plans have been passed under the Building Bye-laws, 422 are provided

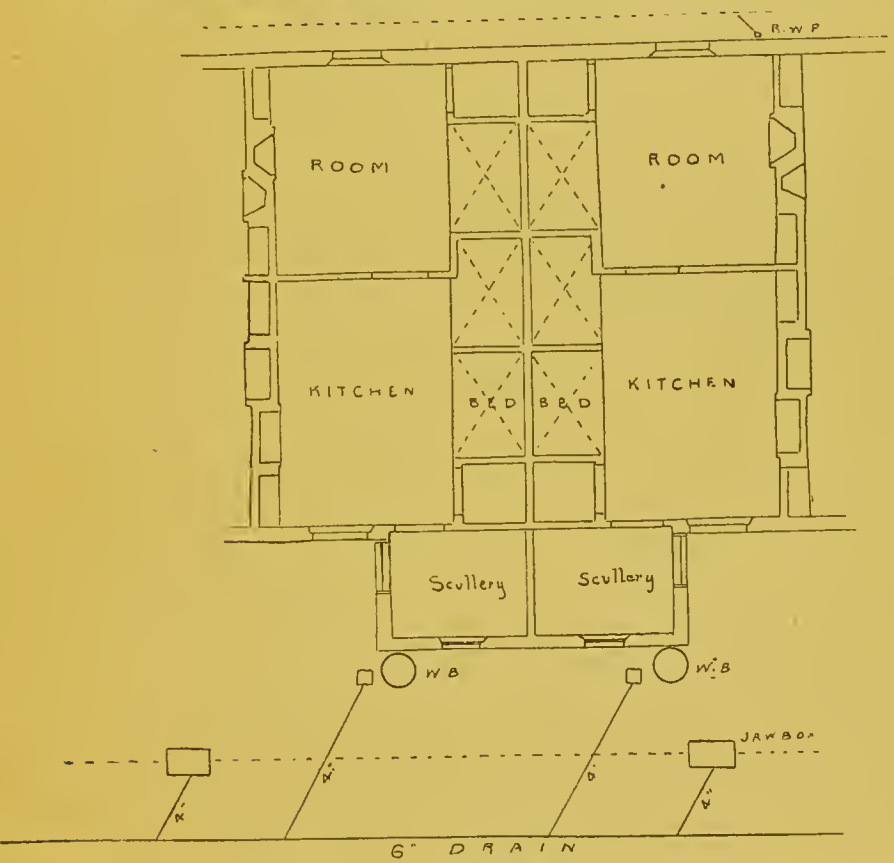


Fig. 6.

with sculleries. These sculleries, if they have a water supply, facilitate the keeping of the kitchen tidy and comfortable as a sitting room and living room. If there is no water tap in the scullery, it is of much less use. The plans (Fig. 5 and Fig. 6) show sculleries (1) with water supply, and (2) without water supply. The former is an unusual type of miner's house, and was not built by the mine owners, but has been taken on a long lease.

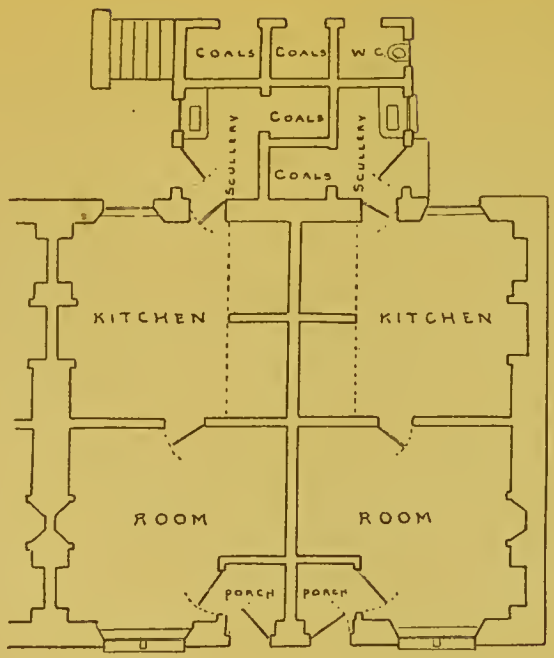
Light and Ventilation.—The minimum window area required is one-tenth of the floor area, and, under the bye-laws, windows are invariably sashed and double hung so that one-half of the total space is available for ventilation. Care is taken that the window tops reach as nearly as possible to the ceiling to facilitate ventilation. In rooms where there is no fireplace and chimney, special means of ventilation are required, and consist almost invariably in a roof ventilator—a circular tube at least six inches in diameter, protected by a cowl. In the kitchen where there is always a fire, the chimney is, of course, important as a ventilator.

Back Doors.—In the great majority of two-roomed houses there is only one entrance—by the kitchen door,—the room being usually directly off the kitchen, so that through ventilation is obtained by means of the kitchen window in front and the room window behind, through the intervening doorway. Of the 873 miners' houses for which plans have been passed, 193, or 22·1 per cent., have also back doors, giving access to back yards, gardens, out-houses or the like, and aiding in through ventilation. The plans on pp. 25 and 27 and Fig. 20 at p. 54 show houses with back doors.

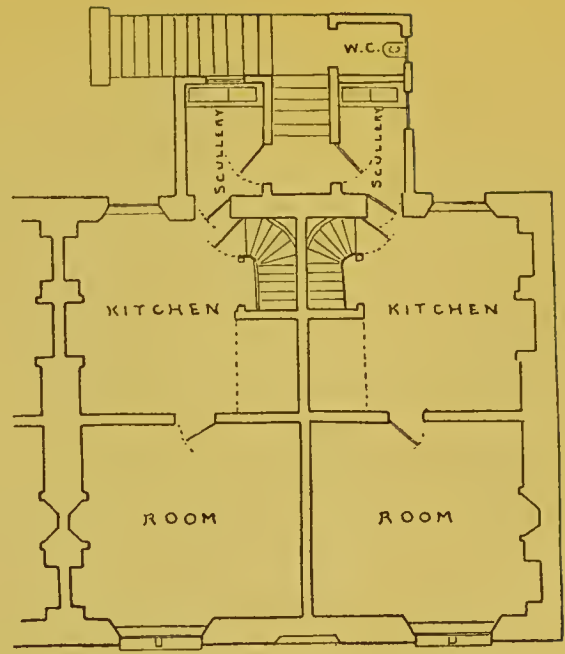
Inside Water Supply.—Of the 873 houses, 589, or 67·5 per cent., have an indoor water supply, the water tap being in the scullery in 375 instances, or 42·9 per cent., and in the kitchen place in 214, or 24·5 per cent., as illustrated in the plans on pp. 20, 22, 25, and 27, and in the photograph (Fig. 9). For the remaining 264, or 30·2 per cent., there is only an outside water supply by pillar wells, sometimes too far apart for convenience.

Baths.—Baths have been provided in 69, or 7·9 per cent., of the 873 houses. Nearly all are three-roomed houses in one village. They were built in 1904-5. This village was begun about 1900 and has been gradually extended up to 1908 inclusive. Two-roomed houses built in 1907-8 in the same village have not been provided with baths. The photograph (Fig. 9) and the plan on p. 27 show the position of the baths in the house sculleries. They have no hot-water supply, but hot water can be obtained from the adjoining clothes boiler. It will be observed that one cold water tap serves for both.

Washing Houses.—Facilities for clothes washing are provided



PLAN OF GROUND FLOOR



PLAN OF FIRST FLOOR

FIG. 7.

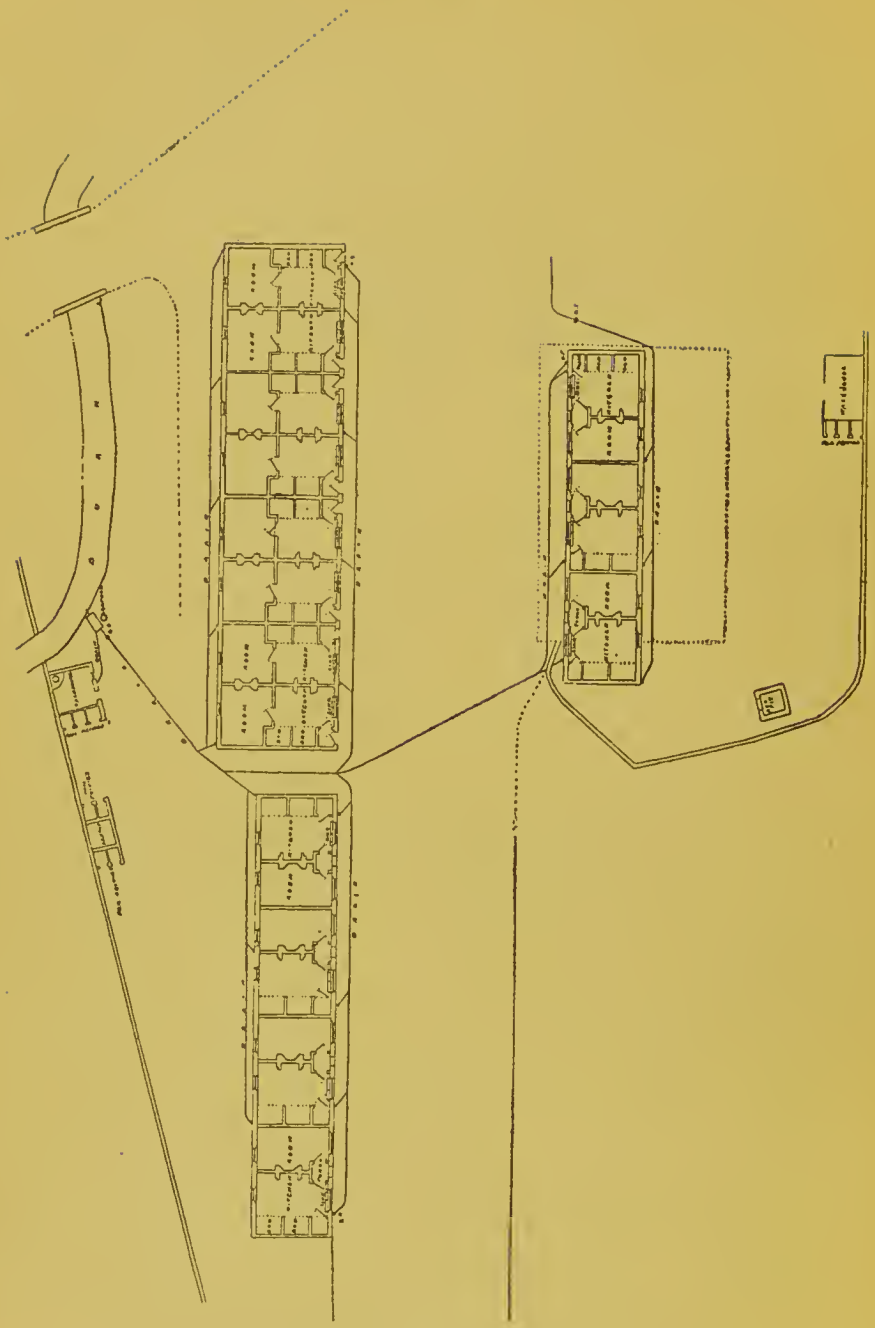
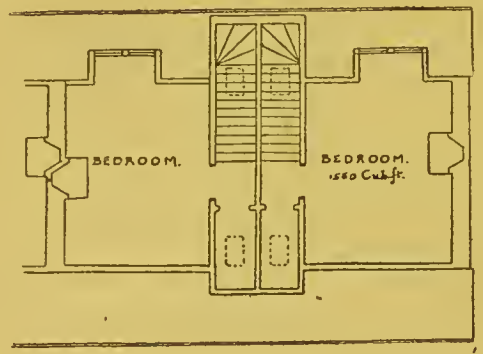


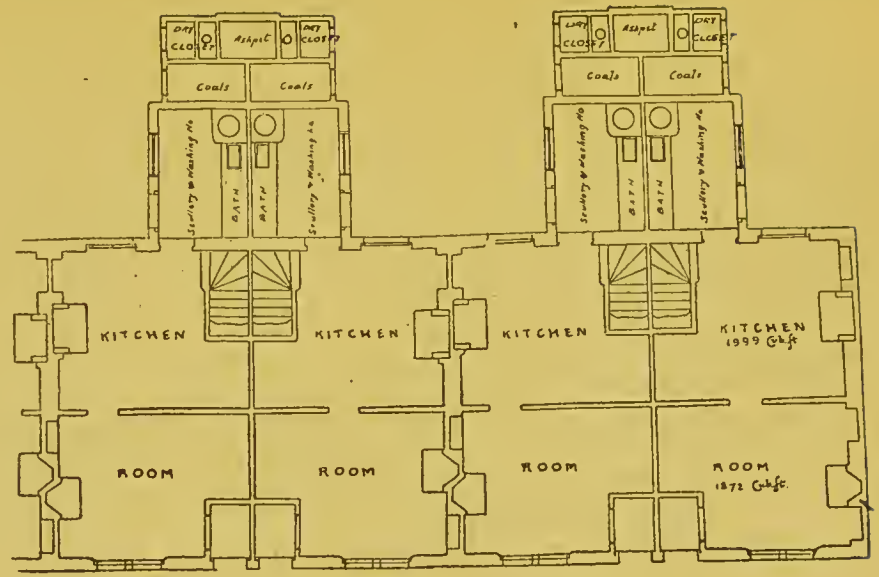
Fig. 8.

FIG. 9.

To face p. 26.



— PLAN of UPPER FLOOR —



— PLAN of GROUND FLOOR —

FIG. 10.

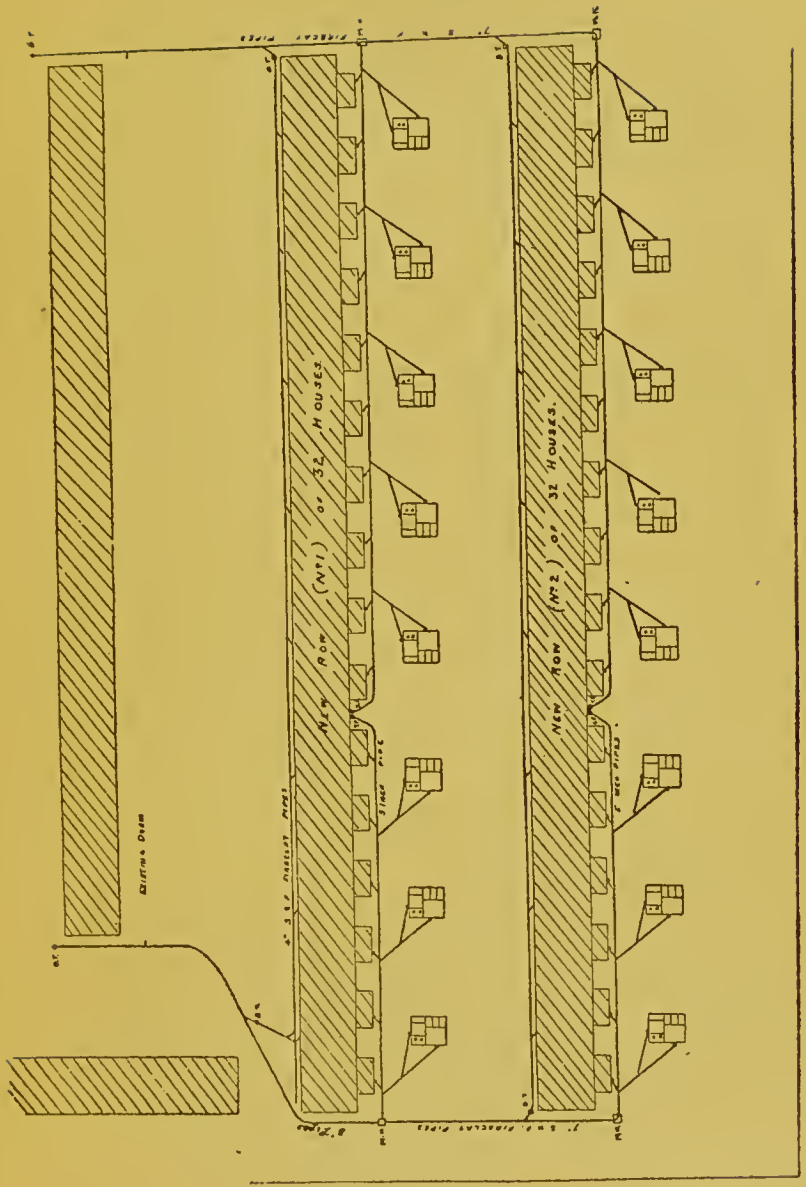
for all the 873 houses. In 127, or 14·5 per cent., the sculleries have a clothes boiler, and in 746, or 85·5 per cent., there are outside washing houses. The plan (p. 27) and photograph (Fig. 9) show a washing boiler as provided in a scullery. It is also shown in the plans on p. 30. Outside washing houses are situated in the blocks shown on pp. 29 and 32.

Coal Cellars.—All the 873 houses have means for storage of coals. In a few cases wooden coal-bins are provided in the kitchen, but nearly always the coal houses are outside and are properly allocated to dwelling houses and kept under lock and key. Coal houses are shown in the blocks on p. 29.

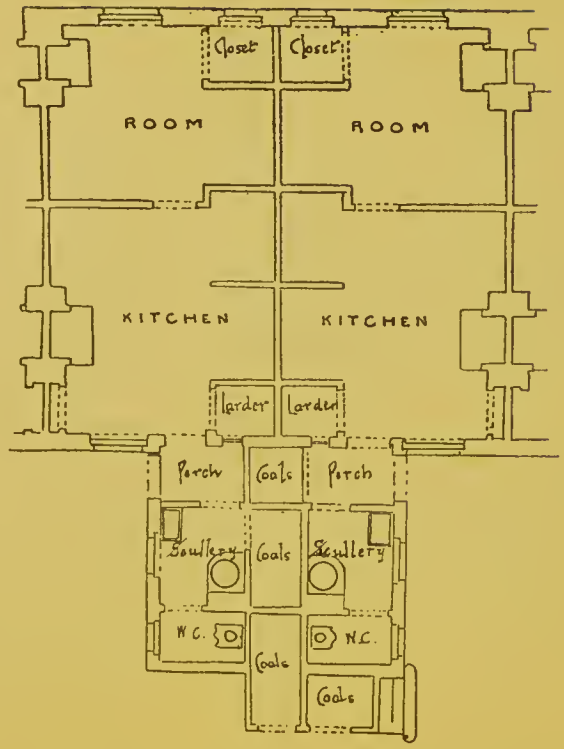
Sanitary Convenience.—Of the 873 houses, 334, or 38·2 per cent., have the use of water closets, and 539 or 61·8 per cent. use dry closets. Of the former, 53 houses have each a water closet for itself (p. 30), and in 281 cases there is one closet for two houses (p. 31). For dry refuse, 176 houses in one village have dustbins. All the rest of the 873 use ashpits, roofed over to keep out rain and sun, but dustbins are being substituted for them in another village of 164 houses.

Drainage.—House drains discharge into open inverts (semi-circular channels), usually of cement concrete, or into underground drains; invariably, of course, the latter where water closets are in use. If by open channels, it is required that they shall be at a suitable distance from the houses and be of sufficient size, with a smooth surface and a proper fall towards a covered sewer or drain as an outlet. Some of them are flushed several times daily by automatic flushing tanks. The plan on p. 32 shows the position of such a tank (in the 'Syphon House') and channel. If there is no indoor water supply, there are no house drains, but slop water is emptied into open channels or over outside gully gratings giving entrance to underground drains, and where these are provided the usual requirements as to materials, size, fall, jointing, trapping, and ventilation are enforced. Drainage arrangements are indicated in the plans on pp. 23, 26, 29, and 32.

Roadways and Footpaths.—The village roadways are usually in fair condition. In a few rows there are good footpaths or areas of cement concrete; in most of the others there are door steps of like material.

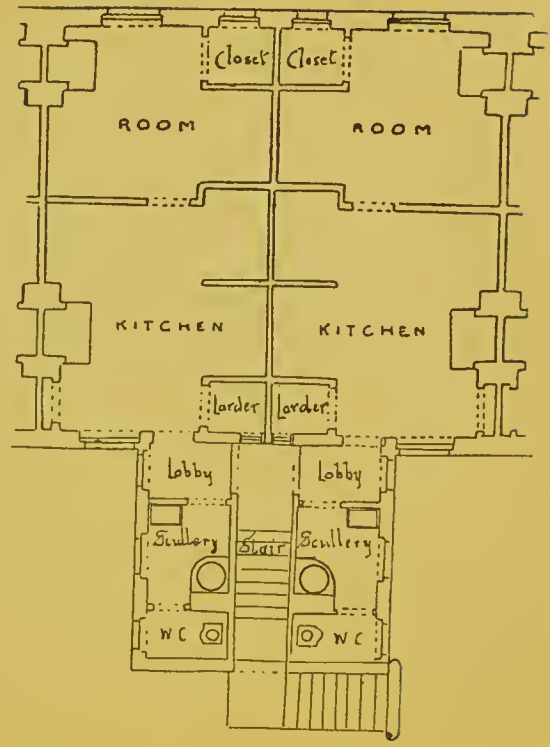


BLOCK PLAN
FIG. 11.

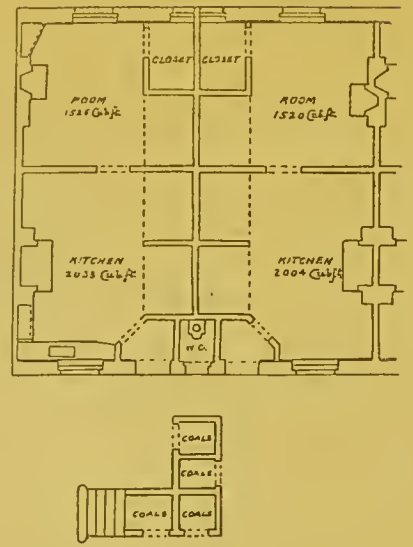


Ground Floor plan

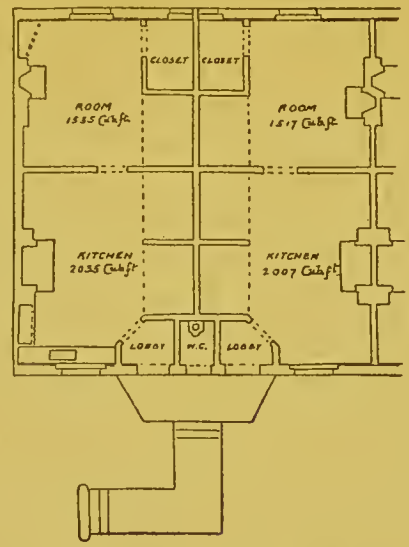
FIG. 12.



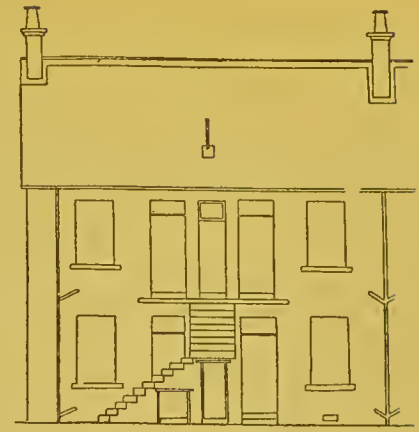
Upper Floor plan



GROUND FLOOR PLAN



UPPER FLOOR PLAN



BACK ELEVATION

Fig. 13.

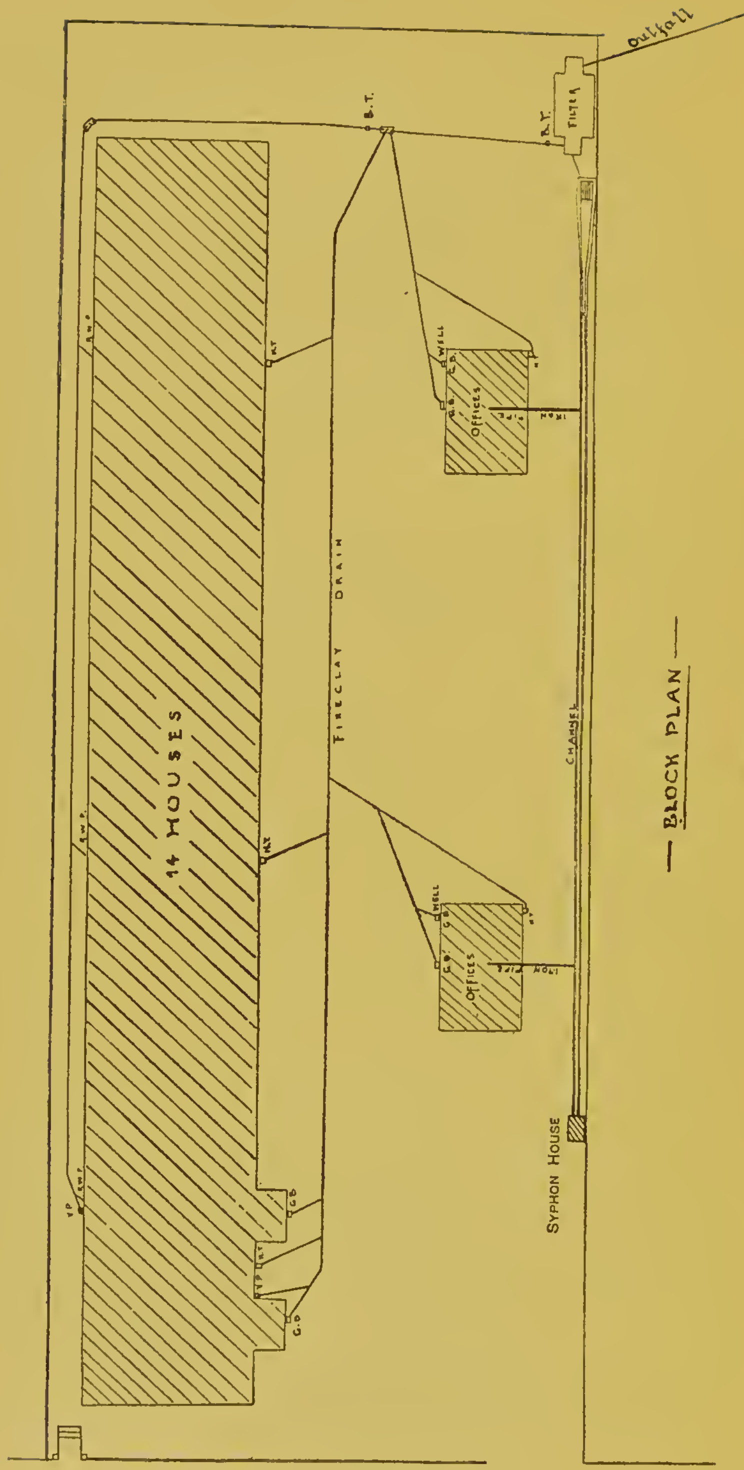

Outfall
FILTER
B.T.
14 HOUSES
FIRECLAY DRAIN
OFFICES
OFFICES
WELL
WELL
CHANNEL
SYPHON HOUSE
— BLOCK PLAN —

Fig. 14.

PART III.

HOUSES BUILT BEFORE 1899.

In the landward districts of the Counties of Stirling and Dunbarton the number of houses erected previous to the passing of the Building Bye-laws in 1899 and occupied by miners at the time of the police census in June, 1909, was 1,881. This is more than double the number of the houses built since 1899. As will be seen later on, very many of the older houses have been repaired or renovated within the last few years. Their age varies greatly. The most ancient of all are in the neighbourhood of Carron, and belong to or have been leased by Carron Company. One three-storey tenement of eight dwellings dates back to 1770. Other three houses were built in 1803. A small village which has just been closed against human habitation belongs to 1804, and another row which is still occupied dates from 1806. Next to these in age come various rows in the southern part of East Stirlingshire—Redding, Reddingmuirhead, Wallacestone, Canal Row, Middlerigg, Wester Shieldhill, Summerhouse, and Rumford Square. They were erected between the years 1829 and 1839 and still give accommodation to a very considerable population. The village of California, also in South East Stirlingshire, was built in 1849, and no doubt took its name from the region of the gold boom at that time, just as a modern colliery in the same part of the county was christened Klondyke by the miners —and I have heard two or three houses attached to it go by the name of Dawson City. Blackbraes, near California, belongs to the same period, and so also do the rows at Skinflats in the Bothkennar part of Grangemouth parish. The village of Knightswood in East Dunbartonshire is nearly as old. Between 1860 and 1875 a large number of miners' houses were built. These include

the principal colliery villages in East Dunbartonshire—Smithston, Overcroy, Twechar, part of Barrhill, Auchinstarry, and Langmuir Rows. Langdyke and Glen Village in Eastern Stirlingshire and the older rows at East Plean in Central Stirlingshire belong to the same period. The houses at Wester Gartshore in Eastern Dunbartonshire were erected in 1880. Since the passing of the Local Government Act of 1889, under which County Councils were created, but previous to the Building Bye-laws, which came into force ten years later, a number of houses, including the village of Queenzieburn, in Kilsyth parish, the greater part of Standburn, in Muiravonside, and some at Banknock, were built, and the officers of the District Committee were consulted with regard to the plans of certain of them. The earlier rows of some of the modern villages in Central Stirlingshire belong to the same period.

Structure.—The walls, of stone or brick, are never hollow in the older houses, and are very seldom strapped and lathed under the plaster. Damp-proof courses at the base are absent. The floors may be of wood, or pavement brick, or stone flags, or lime cement. The room may have a wood floor, and the kitchen a brick or stone or lime floor. The floors are usually at or near the ground level, and the wood floors were seldom or never ventilated underneath when the houses were built. Also, rain gutters may not have been provided, or may have become broken or useless in course of time, and may not have been renewed. Commonly such rain gutters as exist were designed to discharge into water barrels, but sometimes these have been wanting, with the rain discharging at the base of the walls.

The ground level outside the back or gables of the houses may be higher than the floor level, and surface water may drain towards the house walls. Under such conditions damp has been a most common defect in these old houses.

All the houses now in question having been built prior to 1899, it is impossible to give with the same approach to accuracy statistical information such as has been furnished by plans lodged under the Building Bye-laws. But for purposes of comparison some figures are submitted regarding 1,643 of the 1,881 houses

built before 1899. It is to be clearly understood that the figures are no more than approximately correct.

Dimensions. Number of Apartments.—Of the 1,643 houses 424, or 25·80 per cent., are of one apartment; 1,175, or 71·51 per cent., are of two apartments; 32, or 1·95 per cent., are of three apartments; 11, or ·67 per cent., have four apartments; and 1, or ·06 per cent., has more than four apartments.[1]

Cubic Capacity.—The cubic space is less than in modern houses. The ceilings are lower, and the apartments smaller. Not infrequently the houses are only one room deep, and two or occasionally three adjoining apartments, each originally a one-roomed house, are taken by one family and used as a single dwelling.

Bedplaces.—Structurally these are nearly always open entirely from floor to ceiling and from side to side, but, as already noted, ventilation is much interfered with by the housewife's curtains hung at the top and sides.

Sculleries.—These seldom exist in old houses. Sometimes there is an entrance porch which serves as a store, and partly also as a scullery, but without a water tap or sink.

Light and Ventilation.—There is always a front window adjoining the door. Usually it is not very large, and its top is not infrequently too far from the ceiling. Where the walls are low cubic space may have been gained by 'camceiling,' and this space is never properly ventilated. The front windows are mostly sashed, but are not usually hung on cords with pulleys for proper opening. Confining the figures to the 1,175 houses of two apartments, about 432, or 36·8 per cent., have their sashed windows double hung. Commonly the lower sash can be raised and kept open on a support of some sort, but the upper part opens only for a few inches, and that not conveniently, perhaps only from the outside. Occasionally there is only a single hinged pane in the corner of the window. A small hinged window in the back wall of houses which are only one room deep greatly aids ventilation.

[1] This is a manager's house.

Inside Water Supply.—Of the 1,643 houses the total number with water supply indoors is only about 45. The occupiers of all the rest go outside for their water, usually to pillar wells at the further side of the pathway in front.

Baths.—None of the 1,643 houses have baths.

Washing Houses.—Of the 1,643 houses only about 400, or 24·3 per cent., are provided with washing houses. All the rest, or 75·7 per cent., have to do their domestic washing in a tub placed on a chair or trestle, either within the kitchen or outside if the weather permit.

Coal Storage.—Of the 1,643 houses about 470, or 28·6 per cent., are entirely without coal houses; and to this number may properly be added about 120, or 7·3 per cent., in a village where the coal houses are in such a ruinous condition as to be unusable. It may be taken that in nearly all these 590 houses coals are stored underneath a kitchen bed.

Sanitary Conveniences.—Of the 1,643 houses 119, or 7·2 per cent., have the use of water closets. The rest depend on outside dry closets or privies, excepting a few which have been without any such accommodation.

Refuse is deposited in ashpits, most of which are roofed. In South Eastern Stirlingshire, where the villages are nearly all old, of 555 houses regarding which note was taken, 383 have the use of roofed ashpits and 172 of open ashpits.

Drainage.—The drainage is not nearly so good as in the newer houses. There are few underground drains. Some of the open channels are badly laid with insufficient gradient and irregular surface. In very few villages are the channels flushed automatically, but where such flushing exists it is very valuable.

Roadways and Footpaths.—The conditions are very different in different villages. In a few cases they are very bad, the surface of the private roads being very irregular, with deep ruts and pools of mud in bad weather. Access in one or two instances is even dangerous, especially at night. But in the great majority the roads are in very fair order.

PART IV.

ADMINISTRATION.

The previous parts of this report have been confined to a statement of facts. It is proposed now to consider the facts in their bearing on the general administration of the villages. In doing so I begin with what is at the present time by far their commonest and most serious defect.

(1) REFUSE REMOVAL.

The most flagrant nuisance that can be found in a village community, whether mining or ordinary, is the privy-midden or privy-ashpit system, which still prevails in so many places in Scotland. It exists, though in very differing degrees, at most of the colliery rows in these counties.

Nothing puzzles me more in rural public health administration than the common failure to realise the importance of very frequent removal of filth from the immediate neighbourhood of groups of dwellings. Other things being equal, the larger the population and the longer the intervals between removal the worse is the nuisance. There can be no greater contrast between the amenity and health conditions of two otherwise similar communities than that which results from daily clearance of refuse, as contrasted with the accumulation for a month or more of the whole festering filth of the place, in privies and ashpits dotted throughout a village. Such privy middens, situated perhaps only ten or fifteen yards, occasionally much less, from dwelling-house doors and windows are a source of constant complaint by the inhabitants, especially in summer. They are serious factors in the production and conveyance of disease, particularly by the breeding of flies, which, with their feet dipped in filth, invade the houses

and settle on articles of diet, including milk and jam and butter, and on children's faces after food. Also, dogs and cats may rake amongst the refuse and afterwards play with the children, or contaminate food or milk, often standing exposed on a kitchen table.

The emptying of such privy ashpits is a particularly loathsome process and spectacle. The illustration (Fig. 15) shows an ashpit in course of being emptied, and only about 15 feet from the windows of a colliery row.

In Special Scavenging Districts, formed under the Local Government and Public Health Acts, and administered by the sanitary authorities, the aim usually is and always should be frequent refuse removal. Not uncommonly in such special districts, even under the strict rating limits of the Local Government (Scotland) Act, 1894, a daily service has been possible, and now that the Act of 1908 is in operation this should become the general rule. Colliery villages are seldom within special scavenging districts, but there is no good reason why they should not be as well kept in this respect by the owners as is the best managed special district by the Local Authority. Even in the absence of water closets, daily or very frequent refuse removal is quite practicable by means of pail privies and movable dustbins, both being emptied into the scavenger's cart. If the work is not undertaken by the owners, then the village, if large enough, should be formed into a special scavenging district, and to facilitate that being done, a requisition under Section 44 of the Act of 1894 should not be essential. Local Authorities should be endowed with the same power of proceeding on their own initiative with regard to scavenging districts as they are with regard to drainage and water supply districts under Sections 122 and 131 of the Public Health (Scotland) Act, 1897. Where a village is inconveniently small for this purpose, the mine owners have the great advantage that, the whole place being theirs, they can make much better arrangements than in an ordinary hamlet where every house has a separate owner. The question is simply one of expense, and the profit far exceeds the outlay, as respects both health and decency. Of course those who receive the benefit should defray the cost. In special scavenging districts the rate is leviable one-half on owners and one-half on occupiers. That is quite equitable. The occupier is benefited in respect of the

FIG. 15.

To face p. 38.

health and comfort of himself and his family; the owner is saved the disorganisation of his work and the general ill effects which result from outbreaks of infectious disease, especially of enteric fever spread by means of filth accumulations.

Even at present, whenever enteric fever is known to exist at a colliery village the owners at once comply with my request to institute very frequent refuse removal and to continue it until the outbreak is at an end. There is no good reason why a course which can be adopted and continued for weeks or perhaps months whilst disease actually exists should not be a feature of village administration when outbreaks are absent. It is much better to prevent than to stamp out epidemics. If existing rents are too low, the occupier's share of the cost of more frequent scavenging would just have to be added.

In the case of rows attached to dying collieries, where it is desired by the owners that structural alterations be minimised, cleanly conveniences and daily refuse removal would do more to excuse continued occupancy than any other single item in the code of sanitation.

It is a pleasure to be able to state that in one of the largest mining villages of the two counties daily refuse removal is a feature of the owners' management. In another village which has had a very unfortunate experience of enteric fever, daily removal has been instituted. In some others the regularity and thoroughness of cleansing of privy ashpits have been much improved. But there can be regularity without frequency, and systematic monthly emptying is utterly insufficient.

In a few old rows in South East Stirlingshire, sanitary conveniences were entirely wanting until recently. Under such circumstances, fields and woods and hedgerows were resorted to, and domestic refuse was dumped anywhere in the neighbourhood of the rows. While this was quite opposed to the habits of a well-governed community and was an abominable training for children, yet the resulting nuisance was really less than under the conditions above discussed, where filth is accumulated in large quantities in the midst of villages, without frequent removal.

In reply to my expostulations on this subject a former mine owner once told me about his earliest efforts to provide sanitary conveniences for places where such primitive habits prevailed. He

said that outhouses of brick or stone had been tried, but were quickly destroyed. Then cast-iron erections, such as are provided in towns for public use, were purchased, but even these could not resist the attacks made on them, and only the framework, being the stronger part, was left standing. Such a skeleton, with the sun and sky showing through it, made a very peculiar object on a moorland behind an old colliery row. Next, and finally, sheet iron was used for privies, and a ring section of an old pit-head engine boiler was placed behind it for an ashpit. Some of these still remain, and though rust has partly destroyed the sheet iron, the boiler sections have withstood the ravages both of man and of nature.

A Vicious Circle.—The mine owner is apt to attribute the destructive practices which occasionally lay waste the outhouses of a row solely to malicious mischief. But there are faults on both sides, and sometimes the greater blame lies at the door of the employer, or perhaps of his predecessors who first opened up the coal-field.

In districts where mining dates back to the earlier half of last century the houses were erected with little regard to or knowledge of the elements of sanitation. Some of these still stand and many others have stood until recently. Though many well-behaved and cleanly miners and their wives occupy and make the most of these old and defective dwellings and villages, yet it cannot be expected that the best class of employees will continue to live under inferior conditions if they can find better. They make their way elsewhere and their places are taken by a less desirable class, who may do much to nullify the efforts at improvement made by the mine owner, whether of his own accord or under pressure by the sanitary authority. And so a vicious circle is established: bad houses bring bad tenants, and bad tenants make repair of houses more or less futile. They break new lath and plaster, injure new kitchen ranges, entirely neglect cleanliness and ventilation, and annoy their neighbours by dirty habits both indoor and out. But if thorough instead of half-hearted renovation is the policy of the owners, if a capable caretaker is appointed, and outside cleansing systematically maintained, the bad tenants can be gradually cleared out and a better class induced to take their place.

General Scavenging.—While the emptying of privy middens is occasionally left to a contractor, perhaps a neighbouring farmer, whose visits are far too infrequent, and whose work may be very perfunctorily performed, matters are very much better in respect of cleansing of surface channels and drains and roadways. I think there is no exception to the rule that mine owners employ a scavenger to give his whole time to these matters. The result of his labours depends a good deal on the structural conditions with which he has to deal. If the channels and roadways are well made, they are easily kept clean, but otherwise the reverse is the case.

The scavenger's duty usually includes attention to privy floors and seats. Where these dry closets are under lock and key, and each convenience duly allocated to certain households, little attention is required. Where, on the other hand, there are no locks and keys, and no allocation, the scavenger's toil is like that of Sisyphus. No sooner has he swept out a privy floor than its defilement by children is resumed, and such places are inevitably in a condition which makes them utterly unusable by any self-respecting adult. Here again the defence may be that allocation is a failure because keys get lost and locks broken and doors torn from their hinges. But that is simply another phase of the vicious circle. If a village is badly planned so that the closets are inconveniently situated and without suitable access, and if in other respects the place is repellent to families who have seen better conditions elsewhere, then though it may have many cleanly inhabitants struggling to live a decent life in adverse circumstances, its population will yet include many whose dirty habits and destructive tendencies go far to counteract any but the most determined efforts at improvement. But the difficulties are by no means insuperable if the facts are fairly faced and grappled with.

Water Closets.—In the most modern villages or rows the arrangements are usually very satisfactory. As shown in the plans on page 30, in one of the streets of houses at East Plean, known as South Plean Cottages, each dwelling has a good water closet opening off a scullery in an annex to the house.[1] At Fallin

[1] Similar plans have been followed in a new row of houses at Rumford, belonging to Carron Company.

(see page 31) there is a water closet to every pair of houses, so situated as to leave no doubt about responsibility for its being kept in order. In the photograph (Fig. 16) the middle door on the balcony, and the corresponding door on the lower flat is that of the water closet. When miners' rows are within a special water supply and drainage district, water closets are often introduced even for old houses. This is the case at Carron, Carronshore, and Carronhall, and has made a vast difference in the amenity of the rows.

The introduction of water closets must usually be conditional on the practicability of purification of the sewage before discharge into a stream. In some cases tidal waters may be the natural point of effluence, and no treatment would be required. This is the case at Fallin. In the special drainage district which embraces the Carron rows the sewage is treated. East Plean, where some houses have water closets and others are in course of being provided, already constitutes a special drainage district, with septic tank and percolation and filter-beds. Independently of the existence of water closets, liquid refuse from village dwelling houses and washing houses is commonly itself discharged under conditions making purification necessary.

Where water closets are provided dry refuse is easily disposed of. By far the best system is its deposit in dust-bins or pails, and daily removal therefrom by cart. This practice is followed with the best results by the owners at Fallin, and by the Sanitary Authority at Carron Company's villages just named, which are within a special scavenging district. It is being arranged for also at East Plean.

Dry Closets.—Privacy and responsibility should always be aimed at in respect of privies as well as water closets. In the large modern village of Cowie, water closets have not yet been introduced owing to present impossibility of getting wayleave for a sewage drain, but it is expected that this will shortly be obtained. I mention Cowie because, even with its dry-closet system, privacy has been reasonably achieved by the closet being placed in an annex near the house door. The photograph (Fig. 17) fails to do justice to it because only one side of the semi-enclosure is included. The plan on page 27 shows the arrangement

FIG. 16.

FIG. 17.

To face p. 42.

better. But a water closet is much better than a privy in such a situation.

The Block System.—In the older, and in some modern collieries privacy and responsibility are rendered very difficult by the block system of outhouses which is almost universal where dry closets are provided. The situation of these blocks is shown in the diagram at pages 13, 29, and 32, and is well indicated in the photograph (Fig. 2) opposite p. 14. As a rule the blocks contain wash-houses, coal-houses, privies, and ashpit. It is true that the closets are always on the further side from the dwellings, but there may be other dwellings beyond, and in any case they cannot be approached without a degree of publicity, which is very deterrent to women. In some rows, in despair of keeping doors in order, brickwork screens have been built instead.

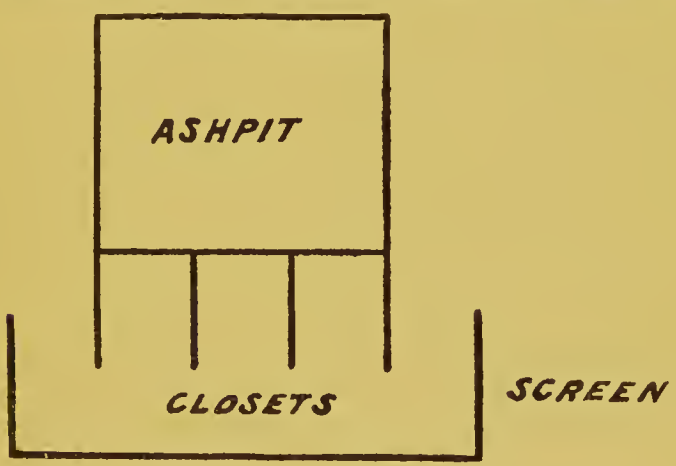


Fig. 18.

Back Doors.—It may be pointed out here that in connection with the disposal of refuse the want of a back door to a house may be a very great inconvenience. In most mining villages the roadways are private, and the blocks of outbuildings are in front of the houses, so that access to them is from the front doors. But occasionally a miners' row faces a public road, and the outbuildings are at the back. If there are no back doors the occupiers have to carry their refuse along the front street, and then through a close or passage to the back. But the row may have

no such passage, and buckets of refuse may have to be carried right to the end of the houses, and thence into the back yard. In such cases doors should be opened in the back walls to allow direct access to the premises in the rear.

(2) COAL STORAGE.

The existence of a domestic coal cellar has only a very indirect bearing on health. But it is manifest that every dwelling should have a convenient place for storing fuel. We have seen that in modern rows this is always provided, though the Building Bye-laws cannot compel such provision, but that in many old rows there are no coal houses, and the immemorial practice is to store coals under the kitchen bed. This creates dirt, and prevents the cleaning out of the space under the bed. Absence of coal-houses is a constant cause of complaint, but when their provision is suggested to the owners it may be replied that they would not be used, and I am bound to admit that some people who have habitually kept coals under beds do not always take readily to the use of coal-houses, but they soon learn. Also, it may be urged that coals are liable to be stolen from an outhouse. But that entirely depends on the kind of outhouse. If conveniently situated and reasonably constructed with a good door and lock and key it will certainly be used. If instead there are insecure wooden sparred gates, and if the village is not under proper supervision, jerry-built coal houses may quite well get into disrepair as a result of destructive mischief. An old row of ruinous coal houses may sometimes be seen with the gates entirely gone, and household refuse dumped where the coals were intended to be kept. Very occasionally, where the dwellings are quite close to the mine shaft, the consent of the miners is obtained to an arrangement whereby the colliery firm supplies coals freely to the houses, and makes a deduction from the wages. No coal-cellars are needed under such an arrangement, for which the reasons are obvious.

(3) WATER SUPPLY.

(*a*) **Sources.**—The sources of water supply for colliery villages vary as they do for other rural villages, but with the additional variation that water is not infrequently obtained from the coal mines.

Upland Surface Water.—The mining villages in East Dunbartonshire and Central Stirlingshire are outwith the area of any rate-provided supply, but East Stirlingshire is in a different position. The northern part of that district is nearly all served by the Falkirk and Larbert Water Trust, and the southern part is wholly within the area provided for under the East Stirlingshire Water Act of 1900. Both supplies consist of upland surface water from the Denny hills in Central Stirlingshire, and the introduction of the latter scheme about ten years ago made a vast improvement in the health conditions of the area which it serves. Unfortunately, as already mentioned, the coal seams which were being wrought in the extreme south of Slamannan and part of Muiravonside are now almost exhausted, and deeper seams have not yet been opened up, so that part of the area for which this water was provided at great cost is in the meantime almost depopulated, other industries not having, up till now, been established to take the place of coal mining. Notwithstanding this, the prosperity of the district as a whole has been so much increased by the provision of a systematic water supply that the water rate, though still high, is now appreciably lower than it was. Before the introduction of the scheme the conditions were deplorably bad. The mining operations had dried up some deep wells, and part of the surface water was from very peaty land. Both quantity and quality were defective, and in dry weather every hole in the moorland which had retained a little water was searched for and emptied, whilst any running pipe yielding a driblet from old mine workings or otherwise could be seen surrounded by a dozen women and children waiting their turn to collect a gallon or two for household use.

Before the East Stirlingshire water became available aerated water sellers from Falkirk did a very large business in the district, and a family whose rent was 2s. 6d. weekly sometimes paid other 2s. 6d. for lemonade and soda water, this being equal to a water rate of 20s. per £ for drinking purposes only. I have even heard of a collier resorting to soda water for the purpose of washing his face. But the whole district is now within the area of supply.

Mine Water serves several large villages in the two counties. Such water may be good or bad according to circumstances. As

regards safety it is essential that it should not be derived from working levels. Yet instances to the contrary have not been unknown, and one very serious outbreak of enteric fever due to this cause occurred in the earliest days of County Council government, in an East Stirlingshire village which is now unroofed and ruinous. The infection evidently began with a miner suffering from an unrecognised attack of the disease. The water in the mine was polluted excrementally, and was pumped into a pond near the village, where it was open to further pollution. The disease spread and some of the alarmed villagers went for water to the open well of an adjoining village. Into this well they dipped their pails, and its water also became infected, so that the epidemic spread through both villages and about 90 cases occurred. It happened that the owners of the village first infected had also a colliery in Lanarkshire, receiving water from a neighbouring town, and they arranged to carry water from this source by rail to their Stirlingshire village, the conveyance being by pithead boilers placed on trucks.

Where water is tapped when a shaft is being sunk, an excavation or 'lodgment' may be made at one side, and higher up than the first coal seam. The water is thence pumped to the surface and may be stored in an old pithead engine boiler, placed perhaps on a waste bing, or on high ground near the pit, from which it gravitates to the village. If this is the method of supply, attention has to be given to several points. As the pumping machinery occasionally gets out of order, storage has to be sufficient to tide over the time required for repair. This sometimes involves the construction of a small reservoir or tank of cement concrete. Such a tank is much better than the iron boiler, in which water may become quite tepid in warm summer weather. The boiler has to be cleaned out now and then to remove any deposited matter. For convenience of cleaning it is better that the boiler be not laid quite horizontally on the brick piers which are its usual support, but be tilted so that sediment may gravitate to one end. In connection with one puzzling outbreak of enteric fever in a mining village, apparently associated with such a supply, I found that the man whose duties included periodical cleansing of the boiler had to go right inside, and that he did so whilst wearing boots which might have been polluted by human excrement.

Mine Water Supply during Strikes and Locks-out.—Where a village uses water pumped from a mine, serious difficulty may arise during a strike or lock-out when the pit is closed down and the pumping stopped. On one occasion a water famine was threatened from this cause, and the colliery owners, with whom I communicated, sent one of their servants on a door-to-door visitation offering to resume pumping if the householders would make a sufficient contribution to cover the outlay. This, as I heard, they declined to do, but, fortunately before the crisis came, the difficulty disappeared, whether owing to abundant rainfall or to the ending of the strike I cannot now recall. The possibility of such stoppage of water supply should be prevented by previous agreement of some sort. If the miners are to continue in the occupation of their houses they should equally continue to be supplied with water.

Hardness of Water.—A point requiring attention when water is obtained from a mine is its quality as regards hardness, which may be as high as 20 or 30 degrees. When used for clothes washing most of the hardness, if due to carbonates, is got rid of by the preliminary boiling, but there being no hot water circulatory system in miners' houses, cold water is commonly used for ablutions and various other purposes. It is not merely wasteful of soap, but is inefficient for washing, and is so unpleasant to work with that cleanliness is discouraged. Very hard water used for drinking is believed to be sometimes detrimental to the digestive organs. Though the methods of softening hard water are well known, and neither difficult of application nor unduly expensive, yet they are not invariably adopted even for the supply of a considerable village, though for the largest of the new mining populations in Central Stirlingshire softening is regularly effected in connection with a mechanical filter. The District Committee endeavoured to form a Special Water Supply district to include all the new villages here, but the scheme was opposed by some of the owners, and their opposition was successful.

Independently of hardness, one large village near the tidal part of the Forth could not use mine water owing to the presence in it of chloride of sodium. Application was made to the adjoining Burgh of Stirling, but the supply there is limited, and all that could be

afforded was water for drinking, cooking, and other indoor purposes. Washing houses and water closets have accordingly been supplied from an adjoining stream which is more or less open to pollution, and the occurrence of several cases of enteric fever led to the giving of public notice by placards and otherwise that washing house water was on no account to be used for drinking.

The quantity of water pumped from some mines is so limited as to be insufficient for water closets, and this affects the whole problem of refuse removal. Also, in such circumstances, baths are manifestly out of the question.

Other Sources.—Various other sources of water for mining villages consist of small local gravitation schemes. If the supply consists of surface or sub-soil water it may be liable to pollution from cultivated fields or roadways, and may require filtration to make it even reasonably safe, but there may be difficulties in the way due to insufficient fall from the source to the area of supply, whilst a thorough scheme of sand filtration, such as is met with in a special water supply district under charge of the sanitary authority, is hardly to be found in connection with a colliery.

In the parish of Cumbernauld, in East Dunbartonshire, the water supply of the principal villages, including two colliery rows, is very defective, and the District Committee prepared a scheme for formation of a Special Water District. The scheme was not opposed by the mining firm nor by the miners, but by the residents in other villages. The opposition was unsuccessful before the Sheriff Substitute, but on appeal the decision was reversed, so that no water district has been formed. One of the mining rows has since then been visited by an outbreak of enteric fever, probably due to contamination of the water supply.

Water Suppy to Mine Workings.—There is occasionally reason to believe that a miner's attack of enteric fever has been due to his using polluted water obtained whilst at work underground. Following on a recent occurrence of this sort, the colliery owners, at my request, issued notices to the men pointing out the danger of taking water from the working levels, and requesting that they bring with them in a small can a sufficiency for drinking purposes. One miner who had been affected in the manner indicated told me that owing to the lowness of the roof of the underground road

to his working place, it was very inconvenient to carry anything with him, but I was assured by the firm that there was nothing in this contention, as the coal bogies had to travel the same road. Where practicable it is a convenience to have a supply on tap at the pit head.

(*b*) **Distribution.**—Whether from a public supply or from a mine the water to a village may be distributed by gravitation either by pillar wells or stand pipes on the roadways, or it may be led into sinks in kitchen window places or sculleries. Manifestly, in the interests of cleanliness, it is much better that the water should be piped into every house, and in some of the more modern villages this has been done, the water tap being placed over a good white glazed earthenware or enamelled sink in the window place, or, still better, in the scullery. It has already been stated that of the 873 houses erected under the Building Bye-laws, 589 have indoor water supply, but that of the 1,643 older houses of which particulars are given only about 45 have water piped into them. The ordinary supply is by pillar wells or stand pipes. These are more or less convenient according to their number and situation. In several villages there are not enough of them, and water has to be carried too far to many of the houses. This tends to uncleanliness. Not infrequently the supply is connected with washing houses.

(4) BATHS.

As already stated, only 69 of the miners' houses have baths, and these are without hot-water supply. Of course it may be said that in such houses baths are not always, and possibly even not often used for their intended purpose, but they certainly make for cleanliness, and there can be no doubt that in houses which possess them they will come to be more and more used as time passes. At a Dunbartonshire village a reading and recreation hall have been built, and in connection with it there are separate sets of baths for the two sexes. Those for women are said to be little used.

As regards the miners themselves, the ideal arrangement would be to have baths built at the pitheads—perhaps large spray baths which could be used by a number of men at the same time on coming up from their day's work; but unless there were to be

some definite obligation on the part of the miners to use them, the mine owners could hardly be expected to provide them. I understand that there is obligatory use of baths at mines in Westphalia. [See p. 69, with reference to the provisions of the Coal Mines Bill, 1911.]

(5) WASHING HOUSES.

Several years ago the late Sheriff-Substitute Gebbie of Dunbarton decided in a case raised by the Local Authority of the Burgh of Kirkintilloch that want of a washing house for use of the occupiers of certain small tenement dwellings was a nuisance under the Public Health Act. That is the only case I know of where the question has been the subject of legal proceedings, and the provision of domestic washing houses is not mentioned in the Act, nor can it be required under any building bye-laws.

But measures which make cleanliness easy are always of value, and it is obvious that they include proper facilities for washing body and bed clothing. The conducting of a family washing in a tub set on a chair in a small kitchen, perhaps in wet weather, with children playing around and inhaling the smelling steamy atmosphere, is unquestionably deleterious to health. The water has to be carried from a well somewhere outside, and has to be boiled on the kitchen fire which is likewise used for cooking. The whole conditions are bad for all concerned, alike as respects health and comfort and temper, and when all is over the washing is very likely to have been badly done.

We have seen that all the newer miners' rows are provided with washing houses. In the best of them there is a clothes boiler in a scullery attached to each individual house. I have not met with any cases where hot water is supplied by a tap connected with a circulatory system from the kitchen range. The highest standard yet reached appears to be the provision of a cold-water tap over an iron boiler with a small fireplace underneath. Houses with these conveniences are greatly appreciated by miners' wives, and the sculleries are kept very clean. Next in order of merit comes a good outside washing house, well lit and ventilated and set apart for a specified number of households. The best sort are of good dimensions with a concrete floor sloping towards a gully trap. Glazed earthenware washtubs are occa-

sionally provided, but usually each housewife brings her own domestic tub. The water is heated in a built-in iron boiler with a fireplace underneath. Occasionally there is a water tap directly over the boiler, but more frequently the tap is attached to a side wall, and the water has to be lifted in pails into the boiler. Less satisfactory is a common arrangement where the water supply is outside the washing house, either by a standpipe against the wall, or by an adjoining pillar well. Worst of all in these respects are washing houses built in blocks at the end of a long village street, and quite without water supply, which has to be carried from pillar wells at a very inconvenient distance. I have seen such washing houses allowed to go to wreck, with broken windows and cracked boilers only half supported by ruinous brickwork.

Sometimes a washing house is in the same block of outhouses with a foul smelling midden, and the heat of the washing house increases the effluvium. Similar nuisance may result if liquid from the ashpit passes not into a covered drain, but into an open channel close to the washing house door. The best remedy consists in abolishing the ashpit and providing dust-bins instead.

Where the domestic water supply is very hard, rain water, to be used as far as it will go for clothes washing, is usually collected in barrels fed by down pipes from the eaves gutters. In that connection a primitive device is still to be seen in some colliery villages. The short down pipe above every water barrel has an old stocking tied over its end, and the water passes through the stocking foot into the barrel. The stocking serves the double purpose of preventing the wind on a breezy day blowing the water past the opening in the barrel top, and of intercepting solid matter washed from the roofs at the beginning of every shower. These rudimentary filters were quite a feature in some colliery rows. None of the houses are furnished with the rain-water separators which were depicted in text-books of public health. The water barrel, of course, has a discharge tap at which pails can be filled to be carried to the boiler in the washing house.

But three-fourths of the older houses are still without any washing house accommodation whatever, and the inhabitants are subjected to all the consequent evils and annoyances. Even when

such houses are being renovated under pressure by the sanitary authority there is the greatest difficulty in getting washing houses erected. Miners' wives, it is urged, will not use washing houses, but prefer to do the work in their own kitchens. The accusation is utterly unjustifiable. No doubt the worst class of washing houses, inconveniently situated and without a water tap, will not be used. That is the fault, however, not of the miner's wife but of the provision made by the mine owner. Where a colliery village is attached to a nearly exhausted working and is likely to be abandoned in a year or two there may be justification for not building new washing houses, but where there is any prospect of even moderate length of occupation, washing houses should be insisted on, and if the Public Health Act is too weak for the purpose, it should be strengthened.

(6) HOT-WATER SUPPLY.

I presume that at most large collieries there must be more or less exhaust steam going to waste. If that is so, and if the village is quite close at hand, this steam might perhaps be utilized for heating water for the washing houses, baths, and other purposes. A steam coil or jet might be led into a common water tank, and the heated water piped from it. Even if waste steam had to be supplemented, such a system might be both economical and convenient, as compared with that under which every miner's wife has to kindle and keep up her own fire in the washing house. And if the water were hard owing to dissolved carbonates, it would be softened by the heating, the precipitated carbonates being removed from the tank when required.

(7) CLOTHES DRYING AND BLEACHING.

Situated, as colliery villages are, in the open country, and perhaps consisting of only a single street, with houses on one or both sides, there is nearly always ample natural facility for clothes drying and bleaching. Clothes poles are usually provided, but sometimes they are allowed to decay without renewal. Bleaching by spreading articles on drying greens is less common, not for want of land, but for want of fence or enclosure to keep out dogs and children. In some rows such enclosures do exist and are regularly used by good housewives who have a healthy pride in the whiteness of their household linen.

(8) DRAINAGE.

As already stated, the typical drainage of a miners' row is by an open surface channel or gutter some distance from the house doors. Where water supply is insufficient such a channel is better than an underground drain as it can be swept out regularly by the village scavenger, but if there is enough water for flushing, a covered drain is better.

The open channels vary from best to worst as do all the other details of a mining village. The best consist of a semi-circular invert of cement concrete, perhaps a foot or more in width, at a sufficient distance from the dwelling house, and regularly cleaned out, not merely by a scavenger, but by an automatic flush tank [1] placed at the head of the invert and discharging a large volume of water several times a day. This arrangement exists at several colliery villages belonging to one firm. The channels should be on the near side of the ashpit, as otherwise slop water will be thrown into the ashpit to save the trouble of carrying it further. The worst drainage is by a dirty gutter a few feet from the house doors, constructed of bricks, with an insufficient fall from end to end, with many irregularities and depressions in which filth collects. These gutters are unprovided with any flush tank, and are incapable of being cleaned by the most conscientious scavenger. They may still be found at one or two old rows belonging to nearly exhausted collieries where the owners would rather close the houses than spend money on improvement.[2]

One point of practical difference between a well-defined semi-circular open invert and an ill-defined nearly flat brickwork channel is its effect on the method of emptying slop water. In the former case the housewife will carry her pail right to the channel and tilt it over the edge directly into it. In the latter the pailful of slops is apt to be shied from the house door merely in the direction of the channel, and to defile the ground between. Similarly, where there is underground drainage, the article known as Denholm's Sink, designed by a former sanitary inspector in East Stirlingshire, has a direct influence towards

[1] In the photograph (Fig. 2) at p. 14 the small white outhouse near the public road contains an automatic flush tank.

[2] One such row has been closed since this Report was written.

cleanliness. It is a strong oblong basin of glazed earthenware, 6 or 8 inches deep, bottomed with a good perforated iron grating, the perforations widening from above downwards, and with a syphon trap between the sink and the drain. Slop pails, I find, are emptied directly into these. Such apparently trifling details make all the difference between a clean and dirty area in front of a miners' row.

One possible disadvantage of even a well-formed open channel, as contrasted with an underground drain, was exemplified in the course of a recent outbreak of enteric fever at a Stirlingshire village. In mistaken zeal for cleanliness the ashpits were hosed out with water which flowed into the channels, and slop water from the houses was also, of course, emptied into them. The surrounding area is the children's ordinary playground, and there was nothing to hinder them soiling their bare feet or hands or toys in the fouled water of the channels. The village consists of several parallel rows of two-storey houses, all but one of which had these open channels. Their water supply is from pillar wells, and a few yards on the further side of the channels are blocks containing privies, ashpits, and washing houses. But the most recently built row has much better arrangements. Each house has a water closet and a scullery with a clothes boiler, and a glazed earthenware sink with a water tap. The drainage here is underground. This row remained practically free from enteric fever whilst all the others suffered. The whole refuse disposal arrangements have now been very greatly improved, and further improvement is in progress.

Drainage Outfalls.—The health of a village is little influenced by the ultimate disposal of its sewage if it is immediately conveyed away to a sufficient distance to prevent nuisance. It may be dealt with by rough irrigation on waste land, or enter a ditch which acts as a nitrifying channel, or be treated in modern purification works with septic tank and percolation bed. But where the surface channel discharges into a foul open ditch close to the end of a colliery row effluvium nuisance cannot but result in warm weather. Once more, this may be the case in old rows belonging to mines which are likely to be closed at a very early date. But it does not justify a nuisance, and if closing of the

FIG. 19.

FIG. 20.

To face p. 54.

houses would result in the miners having to travel a much greater distance to their work until the colliery is shut down, the difficulty can be minimised by good scavenging and periodical cleaning of the ditch.

(9) GARDENS.

Gardens are attached to the great majority of rows. Sometimes a flower and vegetable plot extends from the back or front of each individual house. At other times a stretch of adjoining ground is subdivided into allotments. In many cases there is no sufficient enclosure or fencing for separation of one plot from another, or the only fences may have been erected by miners fond of flower culture and desirous of protecting their own particular patch. Many of the gardens are untended, it may be because the occupier takes no interest in horticulture, but sometimes, in part at least, owing to the want of fencing. Colliery firms might do much at very little cost to encourage gardening, and so discourage more objectionable methods of spending leisure time. Here are photographs of well-kept garden plots belonging to two of the rows in Cowie village, reproduced from a picture postcard. In both cases it will be noted that there is direct access from the house to the garden.

(10) ROADWAYS AND FOOTPATHS.

(*a*) **Roadways.**—Miners' rows may be built alongside of rate-maintained public roads, with good and direct entrance to the houses. At other times the village has been set down in a field, perhaps a quarter of a mile from a highway. The connecting private road may be extremely bad, with boulders and deep ruts, almost impracticable for tradesmen's carts. The same condition of private roadways may exist between neighbouring hamlets, all alike distant from a highway. The roads may, indeed, be quite dangerous to vehicular traffic, or even to foot passengers, especially in the dark, as they are always entirely unlit. Within Special Scavenging Districts formed under the statutes sanitary authorities have very valuable powers for requiring private streets and footways to be "levelled, macadamised, paved, channelled, and made good." But colliery rows are very seldom in special scavenging districts, and it is only since this report was begun to

be written that a local authority has succeeded in getting a decision in the Sheriff Court that such a road, if very muddy and dirty, may constitute a nuisance, injurious or dangerous to health, under section 16 of the Public Health Act. I am of opinion that there should be definite powers to compel owners to provide safe and suitable access to their villages.

Within the rows themselves—as distinguished from their approaches—the condition of the roadway has much influence on the general amenity and comfort of life. One large village consists of several streets whose surface is all askew in respect that they have a gradient not only from end to end, which is very useful, but also laterally, one side being lower than the other, so that surface water is carried diagonally across in irregular ruts and channels. Sometimes the private roads in mining villages are allowed to remain far too long without repair or attention, so that depressions form and are filled with water and mud in wet weather, causing children to get their feet and footgear wet in going to school where they have to sit all day and may readily catch cold. Once more it is the older rows which mainly show these defects, but in this matter I am of opinion that there is no excuse whatever for neglect. However short may be the prospective life of a colliery, enough should be spent to maintain its streets in reasonable repair. There is no such capital involved here as in renovation of village houses.

(*b*) **Footpaths.**—Footpaths are in some respects even more important than cart roadways. A good path of cement concrete laid along the door fronts of a row of houses makes a great difference in cleanliness within the house. In its absence dirt from the outside is carried in on the boots of every entrant, and a tidy housewife despairs of keeping a clean floor, and loses her temper with the children coming and going at their play. Several villages and rows, new and old, have good footpaths (see photograph Fig. 2, p. 14), but the majority have not. They have been provided as part of some recent renovation schemes.

(*c*) **Doorsteps.**—Even a good doorstep of cement concrete or flagstones projecting forward a foot or so in front of the doorway is of much use. Many of the older rows and some which are not so old are defective in this respect. There may be practically no

doorstep, or only the remains of a few broken and worn bricks. Here again the powers of local authorities are at present insufficient to compel what is needful.

(11) LIGHTING.

I have taken no special note of the methods of artificial lighting in vogue at the colliery villages. Excepting at Carron, none of the rows are within special lighting districts so that the roadways at night are lit only from the windows of the houses. The usual illuminant is paraffin oil. Much less commonly, coal gas is available. Electric light is supplied for the houses in Cowie village in Central Stirlingshire.

(12) RENTS.

From the Counties Valuation Rolls for the year 1908-9, I have made a note of the rents of 2,735 houses in non-burghal areas, belonging to mining firms and occupied by their employees. The total rent of the 2,735 is £15,603, the average being £5 14s. 1d. Approximately, these houses are divisible, as regards number of apartments, into 495 of one apartment, 2,096 of two apartments, 126 of three, 14 of four, and 4 of more than four apartments. Of the 495 houses of one apartment the total rent was £1,357, and the average rent £2 14s. 9d. Of 2,096 houses of two apartments the total rent was £12,715, and the average rent £6 1s. 4d. Of the 126 three-roomed houses the total rent was £1,319, and the average rent £10 9s. 5d. Of the 14 four-roomed houses the total rent was £141, and the average rent £10 2s. Of the four houses of more than four apartments the total rent was £71, and the average £17 12s. 6d. The figures are shown in the following table:

No. of Apartments.	No. of Houses.	Total Rent.	Average Rent.
One, - - - - -	495	£1,357	£2 14 9
Two, - - - - -	2,096	12,715	6 1 4
Three, - - - - -	126	1,319	10 9 5
Four, - - - - -	14	141	10 2 0
Over Four, - - -	4	71	17 15 0
Total, - - -	2,735	£15,603	£5 14 1

The rents for houses of the same number of apartments in different parts of the counties vary very considerably. In this connection, East Stirlingshire, where the bulk of the houses are old, may be compared with Central Stirlingshire, which includes the newest villages. Of 670 two-roomed houses in East Stirlingshire the total rent was £3,139, the average being £4 13s. 8d. Of 946 two-roomed houses in Central Stirlingshire the total rent was £6,816 13s. and the average rent £7 5s. In East Dunbartonshire the age of the houses may be roughly taken as midway between those of East and Central Stirlingshire respectively. Of 466 two-roomed houses in East Dunbartonshire the total rent was £2,662 6s. and the average rent £5 14s.

(*b*) **Deduction of Rents and Rates from Wages.**—The mining firms have the great advantage of not requiring to collect their rents, the amount being regularly deducted from the miners' wages. In nearly all cases the public rates are similarly deducted, and paid by the mine owners to the rating authorities. Everyone has heard of the difficulties as to rents and evictions which may arise during strikes and locks-out; but discussion of these would be quite outside the scope of this report.

(*c*) **Proportion of Income devoted to House Accommodation.**—It certainly cannot be said that the actual amount of money spent in rents is high. Moderate rentals may perhaps be used as an inducement to miners to live near their work. When considered in respect to wages it is to be remembered that there are on the average 1·65 mine workers to each house. But these are not all on full pay, as they include boys and a few females. The share of income which should be devoted to house accommodation depends on various factors, such as the size of the family, the amount of income, the amount and kind of accommodation obtainable for a given rent in a particular locality, and the other charges which are to be met by the income. A man with large means is of course in a position to devote a greater than ordinary proportion of his income to house rent, whilst a labourer has, in the first place, to provide for the actual necessities of existence, in the way of food and clothing. But a reasonable amount of house accommodation approaches very nearly to a necessity of existence. It is essentially unprofitable for a miner to occupy

a very small house with too little air space, and without the conveniences for a cleanly and wholesome life.

(*d*) **Mine Owners' Control of Standard of Housing.**—It seems to me that the answer to the question, What shall a miner spend in house rent, lies very largely with the mine owner. At some collieries the housing is very much better than at others, and if only good houses are provided, only good houses can be occupied. The miner's pay is practically the same all over the country, there being a standard rate of wages; the mine owner, it may be assumed, charges a reasonable and not very widely varying rate of interest for the houses he builds: if he builds inferior houses he charges less, if superior houses, he charges more. Therefore, up to a certain point he controls the situation, and he has it in his power to raise appreciably the standard of house accommodation. This is a most valuable power. The best class of miners are the least likely to grumble about being compelled to live in good houses, whilst the grumbles of the lowest class should be disregarded. It is a benefit to their families that the latter class should spend more on housing and less on liquor, and they should be compelled to spend it. There is no fear of this power of employers being abused; the top limit which a miner can pay is soon reached, and the owner, as a sensible business man, must know when to stop.

I would be very glad to see a mining firm make the experiment of building a few houses on the cottage plan which prevails in English villages, the houses being usually, or at least very often, occupied by persons with less income than the average miner. The type is a small two-storey "self-contained" house with kitchen and sitting room on the ground flat and two small bedrooms above, these being reached by a narrow stairway. The two apartments occupied by a Scottish miner generally contain more furniture than all the four rooms of the ordinary English villager. The latter has a great advantage in respect of privacy and also in ventilation. Whatever be the practice as to opening bedroom windows at night I have been struck by the constancy with which in some English villages they are left wide open during the day, the upper rooms being then entirely unoccupied, so that the inmates retire to rest in a clean and healthy atmo-

sphere, and by next morning the living rooms downstairs have also had the benefit of a period free from occupation. Housing habits are difficult to alter, but it is remarkable that the difference between north and south of the border has been so long and rigidly maintained. Figure 21 and plans (p. 61) of part of a row at Deunyloanhead in Central Stirlingshire include some houses which make a cautious approach to the English style.[1] They were not built by mine owners, but were taken on a long lease immediately after being built. They are not large, containing, as they do, only three apartments, but they have an upper as well as a lower flat, and are neatly and tastefully fitted internally. The outhouses and sanitary conveniences are very satisfactory. It was at first intended that the kitchen should contain no bedplaces, but this part of the plan was departed from, owing to the fear that a miner would not take a house without the customary sleeping accommodation in the living room. They are much appreciated by their occupiers, and more of the same sort are intended to be built. The rents, inclusive of all rates and taxes, are 5s. 9d. weekly or £14 19s. per annum. Something of the same kind would be a great advance on the ordinary type of miner's dwelling; and if the style and fitting were plainer, the rent might be correspondingly less. The rent of the three-roomed houses at Cowie is £11 8s., and they are essentially similar. See plans on p. 27.

(*e*) **Cost of Miners' Houses.**—I am told on good authority that, in erecting a row of miners' houses, the sum of £120 per house will suffice to cover the following general specification, if building materials are obtainable near at hand :—

A good room and kitchen house with lobby, back and front door, scullery with sink and water connection, water closet, two iron portable bedsteads in kitchen, grates, painting, drains complete to connection with main drain if near at hand, 15 feet of roadmaking around each block of houses, and 20 feet width of roadway between blocks; houses to be built of brick, roughcast with cement and roof slated.

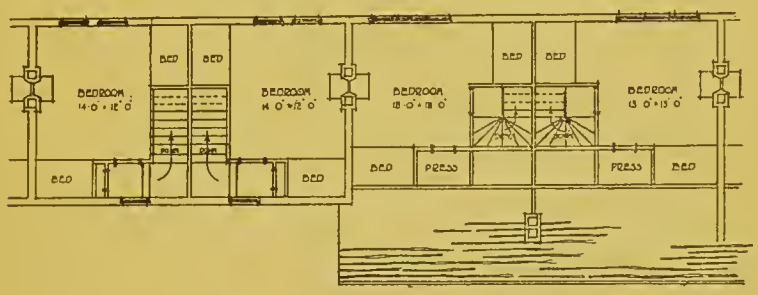
A similar house built of stone would cost £20 extra, for lathing, and labour in dressing stones, sills, lintels, etc. In

[1] The plans (p. 61) also show houses of two apartments, one above and one below, but these are not referred to in the text.

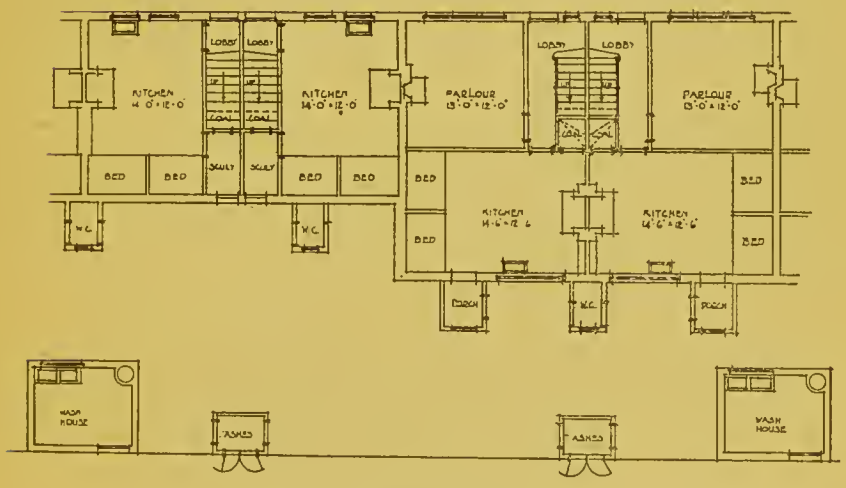
FIG. 21.

To face p. 60.

my informant's view, the rental of a house of this description should be 3s. 3d. per week or £8 9s. yearly, the owner paying the rates. The cost of roadmaking he estimates as follows :— Assuming the road to be 27 feet wide with 9 inches of excavation, 8 inches of bottoming and 4 inches of whin on top, the cost would be £1 7s. per yard for the full width of the road or 3s. per square yard. Kerb and channel in addition would cost 3s. 9d. per lineal yard.



: PLAN OF UPPER FLOOR :



: PLAN OF GROUND FLOOR :

Fig. 22.

(13) BUILDING LEASES AND FEUS.

The greater sanitary activity in rural districts since the advent of County Councils has had an effect on the arrangements made by mine owners with proprietors of land in respect of dwelling houses. Formerly the practice was that the houses reverted to the landowner at the end of the mineral lease, a period ordinarily from 28 to 31 or 35 years. That being so, it was only natural they should not be built in the same way nor fitted with the same conveniences as if they had been to remain longer in possession of the mining firms. Even yet, houses may be built on only a twenty years' lease, but with the important condition that the lessee has the option of taking over the house at a fixed feu duty at the end of the lease, or otherwise he may have the right to renew the lease. Sometimes, however, there was a building lease of 99 years' duration, and long building leases may still be the arrangement. But feuing of the land, which for all practical purposes means permanent ownership, is coming more and more into vogue. This is an important change of custom, and has a very decided influence in improving the character of the houses. The stonework and woodwork may now be quite as good as for the best class of workmen's dwellings in towns and cities, and there is no reason why it should be otherwise, unless from the beginning the prospect is that the coalfield will have only a short life, and that no other industries are afterwards likely to take its place. In a remote country district wholly dependent on coal mining of limited duration, the owners will naturally restrict their outlay on buildings.

(14) PROCEEDINGS OF THE SANITARY AUTHORITIES.

(*a*) **The Public Health Acts.**—It is hardly necessary to state that the various Acts relating to public health are administered in mining districts as elsewhere, in respect of such matters as sanitary inspection, notification of infectious diseases, provision of fever hospitals, and disinfection of houses. With regard to domestic water, the action taken to provide public supplies in East Stirlingshire has already been recorded, and the difficulties met with in Central Stirlingshire and Cumbernauld parish have

been mentioned. In villages unconnected with mines a large part of the duty of the sanitary authority relates to the administration of special districts for water supply, drainage, scavenging and lighting. But hardly any of the mining villages have been formed into special districts, except at Carron, and, for drainage, at East Plean.

Building Bye-Laws.—The work done under the Building Bye-Laws has been indicated in Part II. of the report. But even here the influence of local habit and tradition is notable. In a district where the coal-field was opened up very early, and many rows of houses built which, so far as they remain, are much out of date, the low standard of house accommodation originally established has had an evil effect, which still occasionally shows itself. One village built less than twenty years ago, most of it not long before the Building Bye-Laws were passed, is far behind both in plan and construction. Many rows in less backward parts of the country, though considerably older, are much better. Tradition appears to have its influence alike on mine owners, architects, and tradesmen, and when protest has been made against manifest defects the reply is not unknown—What more would you want? Don't you see that the houses are only for miners? Even building bye-laws have been able only in part to move this dead weight of local precedent. Some of the more recently erected houses in the district in question, though complying with every bye-law and in various details quite satisfactory, are yet defective in respect that the width of the kitchen between fireplace and beds is barely 9 feet, and that there are no sculleries.

(*b*) **Overcrowding.**—Occasionally a case of overcrowding is discovered, either because a man has an unusually large family or because one or two lodgers—employees at the same mine—are kept, and intimation of nuisance under the Public Health Act commonly has the desired effect; but it may happen that a man with a large family has some difficulty in getting a large enough house at a growing colliery where new housing does not always keep pace with increase of work and workmen. These occurrences, however, are not very frequent, and the police

census referred to at p. 7 reveals on the whole a smaller average number of persons per house—5·6—than I had expected would be found.

In East Dunbartonshire I ascertained through the sanitary inspectors the facts for 433 occupied houses. Their total population was 2,453, giving an average of 5·87 persons per house. The total number of apartments was 875, so that the number of persons per room was 2·8. In the different villages for which these figures are the totals, the number of persons per house varied from 4·6 in a small row of 19 houses to 6·0 in a village of 90 houses.

In the principal modern villages in Central Stirlingshire the facts are similar. In 391 houses at Cowie there were 2,388 inmates, giving an average of 6·1, but these figures include 54 houses of three apartments, in which the average occupants number 8·6. If these be deducted and only the two-roomed houses taken into account, the mean number of persons per house is 5·7. In 153 houses of two apartments at Fallin there were 885 inmates or 5·8 per house, and in 163 two-roomed houses at East Plean there were 911 inmates or 5·6 per house. At Banknock, in Kilsyth parish, 66 houses had 383 inhabitants or 5·8 per house, and in smaller rows at Dennyloanhead, in Denny parish, the figures varied from 5·1 to 6·4. The 6·4 village includes a few three-roomed houses. At Queenzieburn village, in Kilsyth parish, 56 houses averaged 6·2 inmates, but certain houses with more than two apartments are included. In the older rows in South Eastern Stirlingshire the number of persons per house ranges from about 3·4 to 6·5. Standburn, which is the largest single village, has an average of 5·7. All these figures include the usual proportion of children, and in any calculation of the cubic space per inmate this has to be taken into account. The minimum allowed for common lodging-houses is 400 cubic feet per adult, two children under ten counting as one adult. As shown in the table at p. 21, the average cubic space in a two-roomed house erected under the Building Bye-Laws is 3,700 feet; and if such a house contains three persons over ten years old and three under that age, the cubic space per adult will be 822 feet. The facts are always noted wherever a case of infectious disease is reported, aud any ascertained overcrowding

is dealt with under the nuisance section of the Public Health Act, but, as already stated, such cases are not common.

(*c*) **Housing of the Working Classes Act.**—Under Part II. of the Housing of the Working Classes Act local authorities have power, on a representation by their Medical Officer, to serve a notice on the owner of a house in the following terms:

> To Take notice that under the provisions of the Public Health Act, 1897, and the Housing of the Working Classes Act, 1890, the Local Authority, being satisfied that the following premises, that is to say
> are in a state so dangerous or injurious to health as to be unfit for human habitation, do hereby require you within
> from the service of this notice to make the said premises fit for human habitation.
>
> If you make default in complying with the requisitions of this notice proceedings will be taken before a court of summary jurisdiction for prohibiting the use of the premises for human habitation.

Not many years after the County Councils began, legal proceedings for a closure order were taken before the Sheriff in East Stirlingshire in the case of one very old group of buildings, mainly occupied by miners, though not belonging to mine-owners. The proceedings were successful, and since that time resort to the law court has very seldom been necessary in either county. Following on correspondence with the owners, houses are often closed after a short interval has been allowed for convenience of occupiers. Otherwise they may be renovated and modernised in various respects. Since 1891 hundreds of the oldest class of miners' houses, including several whole villages, have been closed, sometimes under pressure by the local authority, in other cases owing wholly or mainly to exhaustion of collieries. Many of these houses have been demolished.

[Since this report was written, the Housing, Town Planning, etc., Act, 1909, has been passed and greatly extends the powers and duties of local authorities. In the words of the Local Government Board's circular of 24th June, 1910, "The law as regards the closing and demolition of dwellings unfit for human habitation is simplified and strengthened. Local authorities will, under the new Act, themselves make closing orders." Also, it is

now the duty of the public health authority to call on the landlords of working class houses (not exceeding sixteen pounds in rent) to maintain them in a condition in all respects reasonably fit for human habitation, and if the landlord fails to do so, then unless he intimates his intention to close the house for human habitation, the Local Authority itself may do the work required, and recover from the landlord the expense incurred in so doing, either in a summary manner, or by annual instalments extending over not longer than five years. These powers, including closing orders, are subject to appeal to the Sheriff.]

(*d*) **Renovation.**—Where, under pressure by the Sanitary Authority, renovation is the course adopted, the degree depends on the circumstances. If the houses are to be required only for two or three years the same demands are not made as in cases where there is expectation of long occupancy. One firm whose coalfield includes a district containing many very old groups of houses, has for several years employed a small staff of men almost wholly in this work of repair and renewal. Where renovation has been undertaken, walls have been protected outside by 'rough-harling' with lime or covering with cement, internal plastering has been renewed, old floors of brick or stone with irregular surface harbouring dirt have been taken up and relaid with smooth cement concrete, door steps of similar material have been provided, wood floors have been ventilated below, surface or subsoil water flowing towards house walls from higher ground behind has been intercepted and diverted, roofs have been rendered water-tight, eaves gutters have been provided, and rain water either properly stored in barrels or carried away from the base of the walls.

But damp-proof courses are so troublesome to introduce into existing houses that they are never asked for, and frequently the alterations do not include what is asked for in respect of strapping and lathing of walls, this being objected to on account of the cost, the inconvenience to the occupiers, and the chances of subsequent injury by careless or mischievous tenants. Damp is very difficult to remedy, and the attempts made are sometimes only very partially successful.

Great improvements in ventilation have been obtained by causing windows to be inserted in back walls, and front windows

to be made more openable. But the alterations often do not include the hanging of the windows on cords and pulleys, which, though more costly, is the only really effective way.

Outside the houses, sanitary conveniences have been erected, but these if not properly emptied and cleaned are of little value. Even where the villages are expected to be occupied for lengthened periods, washing houses are seldom provided, so that the very objectionable practice of conducting family washings within small dwellings still prevails. As already stated, coal houses cannot be insisted on by the Sanitary Authorities, so that storage under kitchen beds may continue after renovation. While whole villages have been much improved, the improvements have been limited in these directions, and notable dilatoriness is sometimes shown in meeting the requirements of the Local Authority, so that much still requires to be done. But the policy of renovation is being actively followed, and a great change has already been effected.

SUMMARY.

Summarising the various matters discussed in the course of this Report, the principal points are—

(1) Daily Refuse Removal,

(2) Provision of sculleries, indoor water supply, water closets, dustbins, washing houses, hot-water supply if practicable, coal cellars, paved footpaths, good roadways, and garden plots,

(3) Maintenance of houses, roadways, drains, water pipes, wells, sanitary conveniences, fences and drying greens, in good order and repair.

In any proposal for renovation of old villages and houses the most urgent necessity is that the scheme shall be thorough. As regards the very few cases in which incomplete improvements might be accepted owing to the coal seams being nearly wrought out, daily refuse removal and constant attention to the maintenance and tidiness of roadways and surface channels should invariably be insisted on as conditional to any relaxation of other requirements.

But it has already been pointed out that in ordinary colliery villages District Committees have no sufficiently direct powers to compel daily refuse removal, nor the construction and maintenance of proper roadways and footpaths, nor the provision of indoor water supply, nor the erection of coal houses or washing houses. It may be urged that theoretically some of these objects might be attained by continual prosecutions under Section 16 of the Public Health Act, but all who are acquainted with the administration of that section must be aware that it does not provide a practicable and efficient remedy for any of the defects in question.

In suggesting that further powers are required, the object is not to lay needless burdens either on landlord or tenant. Most of the defects (though not the most serious of all) are now confined to only a minority of villages, and steady progress is being made in the right direction, but the reforms indicated are so nearly essential that they ought to be practically universal. Towards the living of a decent and healthy life they are worth far more than they would cost. They would benefit both coal master and collier. The rents of the houses would have to be adjusted so as to yield a reasonable interest on structural alterations and additions, and so also as to give effect to the principle of the existing Public Health Acts, that the price of sanitation is to be paid in equal shares by owner and by occupier.

For the preparation of the various plans and diagrams illustrating this report my best thanks are due to Mr. T. G. Gough, County Sanitary Inspector for Western Stirlingshire, and to Mr. P. J. C. M'Kenzie, Assistant County Sanitary Inspector in Dunbartonshire.

I am,

Sir,

Your obedient Servant,

(Sgd.) JOHN C. M'VAIL.

The Coal Mines Bill, 1911. Provision of Baths at Mines.— After this report was sent to the Local Government Board, the Coal Mines Bill was introduced in the House of Commons by the Home Secretary, on 15th March, 1911. Clause 77 was as follows :—

"(1) In every mine required to be under the control of a manager, sufficient and suitable accommodation and facilities for taking baths and drying clothes shall be provided at the mine for the persons employed underground in the mine, regard being had to the number of the persons so employed.

"(2) Where such accommodation and facilities have been provided, the use thereof shall be obligatory on the persons employed underground in the mine, and every such person shall be liable to contribute the sum of one penny a week towards the expenses of maintenance, including interest on any capital expenditure, and the owner shall be entitled to recover such contributions from the workmen by deductions from their wages, notwithstanding the provisions of any Acts relating to truck or of any contract to the contrary.

"(3) If the owner of any such mine as aforesaid fails to provide such accommodation and facilities, or if any person after having been employed underground in any such mine fails to make use thereof, he shall be guilty of an offence against this Act."

Obligatory provision and use of baths was thus intended, but the Bill, in the form in which it has emerged from the Standing Committee, is very different. The clause (76 in the amended Bill) is now as follows :—

"(1) Where a majority of two-thirds ascertained by ballot of the workmen employed in any mine to whom this section applies represent to the owner of the mine that they desire that accommodation and facilities for taking baths and drying clothes should be provided at the mine and undertake to pay half the cost of the maintenance of the accommodation and facilities to be provided, the owner shall forthwith provide sufficient and suitable accommodation and facilities for such purposes as aforesaid :

"Provided that the owner shall not be bound to provide any such accommodation and facilities if the estimated total cost of maintenance exceeds threepence per week for each workman liable to contribute under this section.

"(2) General regulations shall be made under this Act for determining what is sufficient and suitable accommodation for the purposes of this section, and any such regulations may make different requirements as respects different classes or descriptions of mines.

"(3) For the purposes of this section cost of maintenance includes interest on capital expenditure (not exceeding five per cent. per annum), and if any question arises as to the estimated cost of maintenance that question shall be referred to an arbitrator to be agreed upon between the parties, or in default of agreement as to an arbitrator then shall be settled in manner provided by this Act for settling disputes.

"(4) Where any such accommodation and facilities have been provided every workman at the mine to whom this section applies shall be liable to contribute a sum equal to one-half of the cost of maintenance (but not exceeding three-half pence per man per week), and the owner shall be entitled to recover such contributions from the workmen liable to contribute by deduction from their wages, notwithstanding the provisions of any Acts relating to truck or any contract to the contrary:

"Provided that the obligation to contribute shall not apply to any workman who is exempted on the ground of health in accordance with the regulations of the mine.

"(5) The management of the accommodation and facilities provided under this section shall be under the control of a committee to be established in accordance with the regulations of the mine, and consisting as to one half of members appointed by the owner of the mine and as to the other half of members appointed by the workmen liable to contribute under this section.

"(6) The workmen to whom this section applies are all workmen employed underground, and all workmen engaged on the surface in handling tubs, screening, sorting, or washing coal, or loading coal into wagons.

"(7) This section shall not apply to any mine where the total number of workmen employed at the mine to whom this section applies is less than one hundred, or to any mine held by the owner under a lease of which the unexpired term is less than ten years.

"(8) If the owner of any mine fails to comply with the provisions of this section, he shall be guilty of an offence against this Act."

The clause as amended contains no provision for the compulsory use of the baths. I have not seen a report of the discussion on the clause, but it is referred to in the following paragraph from the British Medical Journal of August 19th, 1911, p. 403:—

"We notice that the question of pithead baths for miners was debated in Grand Committee of the House of Commons lately on the Coal Mines Bill, but it was decided by 20 votes to 12 not to make the provision of baths compulsory. The general debate took place on a formal motion to delete Clause 77, which made it obligatory upon mine-owners to establish in every mine, under the control of a manager, sufficient and suitable

accommodation for taking baths and drying clothes, and to deduct 1d. a week from the earnings of each man for the cost of maintenance. The Scottish Miners' Federation favoured the principle of compulsion, and in the course of the discussion it was stated that the representatives of the miners generally had decided to support the Government in making the bill compulsory. They hailed the proposal as a great and desirable reform, as there were still hundreds of thousands of houses in which there was no provision for miners taking a bath. The Under Secretary of the Home Office undertook to introduce a clause which would provide that where the miners wanted the bath, and where the cost was not prohibitive, the bath should be provided, and the cost of the upkeep and the return on the capital expenditure be divided in something like equal proportions between the owners and the men. The provision of baths at all pitheads would, there can be no doubt, be of great benefit to the miners, and would have an excellent effect on the amenities of life in colliery districts."